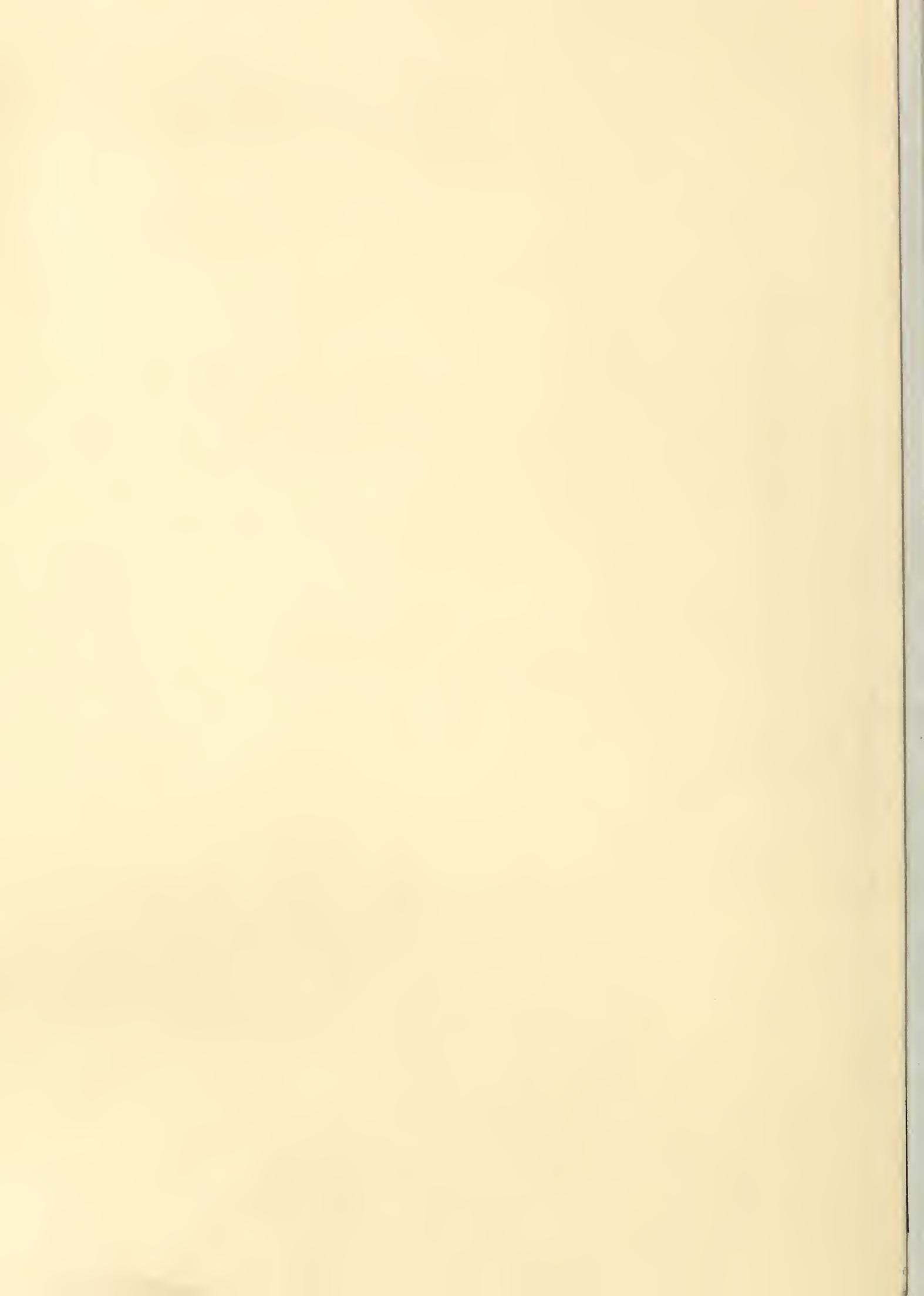


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BETTER FRUIT

VOLUME VI

MAY, 1912

NUMBER 11



STRAWBERRIES ARE ONE OF THE BEST PAYING CROPS THAT CAN BE GROWN AMONG THE YOUNG TREES UNTIL THE ORCHARD COMES INTO BEARING

Beginning with Vol. VII, July, 1912, the subscription price of "BETTER FRUIT" in Canada and foreign countries, including postage, will be \$1.50 per year

BETTER FRUIT PUBLISHING COMPANY, PUBLISHERS, HOOD RIVER, OREGON

Subscription \$1.00 per Year in the United States and Canada; Foreign, Including Postage, \$1.50

Single Copy 10 Cents

What Constitutes a Good Spray Pump?

High Pressure—to throw a strong, fine spray.
A Pump—of sufficient capacity under slow speed.
An Agitator—to keep mixture well stirred so that it cannot clog pipes and nozzles.
Some Method of Cleaning the strainer.

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It is an all-steel one-man machine. It weighs only 600 pounds. It will stir your soil, level your land, cut laterals, pick up dirt and drop it where you want it, and *cut ditches 24 to 36 inches deep at a cost of 2 cents a rod*. It will do more work than big heavy graders in less time and with less effort. One man with two horses operates it. Ditches cut with the 20th Century Grader are "V" shaped, with firm, solid sides—no fear of their being washed down.

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Let us tell you what others say about this wonderful machine. We want to prove to your satisfaction that it's a genuine money-maker. There are many uses to which the 20th Century

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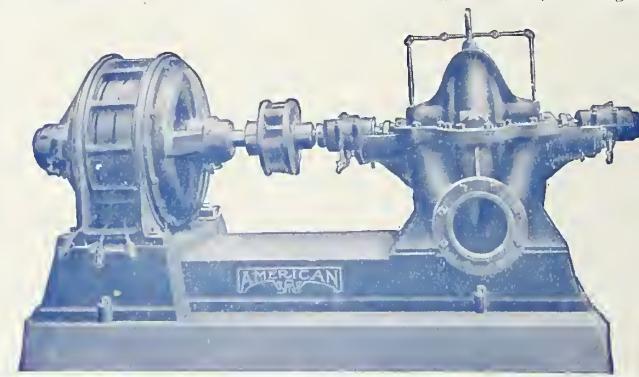
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Our Profit 8½ Per Cent

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Tires may also be too costly—to fine in composition to endure.

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How We Know

We make our comparisons on a tire testing machine, where four tires at a time are worn out under all sorts of road conditions. Meters record the mileage.

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Thus we have proved that Up-River Para—the costliest rubber—is cheapest on the mileage basis.

Thus we have proved that long-fibre Sea Island cotton—the costliest material—is the cheapest in the end for fabrics.

We have proved that wrapped tread tires—the costliest construction—are cheaper than moulded tires—for the user.

So we employ these things. And we use everything else which these years of test have proved most economical—in the cost per mile.

Saving 23 Per Cent

Then came the question of rim-cut tires. We examined thousands of ruined tires, of every make. And we found that 23 per cent of the clincher type were rim-cut.

So we brought out a patent new-type tire—a hookless tire—which makes rim-cutting impossible.

At first this type was expensive. It added one-fifth to our price. But our multiplied output quickly reduced it, until it now costs users no more than standard old-type tires.

This tire—called No-Rim-Cut—has ended rim-cutting forever.

Saving 25 Per Cent

Next came the question of blow-outs—caused by adding extras to the ear—by overloading tires.

To avoid this we made No-Rim-Cut tires 10 per cent over the rated size. That means 10 per cent more air—10 per cent added

carrying capacity. And that, with the average ear, adds 25 per cent to the tire mileage.

With these oversize tires, of the costliest construction—these tires that can't rim-cut—we met the price of standard old-type tires.

The result is this:

Last Year's Profit 8.57 Per Cent

Our profit last year on No-Rim-Cut tires was 8.57 per cent.

With the largest output—with the most modern equipment—our selling price has averaged about 8½ per cent over cost.

That in a risky business, with fluctuating materials, on a tire that's guaranteed.

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Tires can't be made more economically than in this mammoth, modern plant.

Men can't stay in this business, with the risks it involves, on a smaller margin of profit.

In No-Rim-Cut tires you get as much for your money as any maker ever can give. And you know what you get.

If you consider that fair, it's another reason for insisting on these premier tires.

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If you want to grow fruit of the same quality, you must use a brand of Arsenate of Lead that is safe as well as sure. Acid leads or cheap leads of inferior manufacture often cause serious trouble and loss because, where soils are alkaline, there is danger of soil poisoning. The prize-winning exhibits shown were sprayed with

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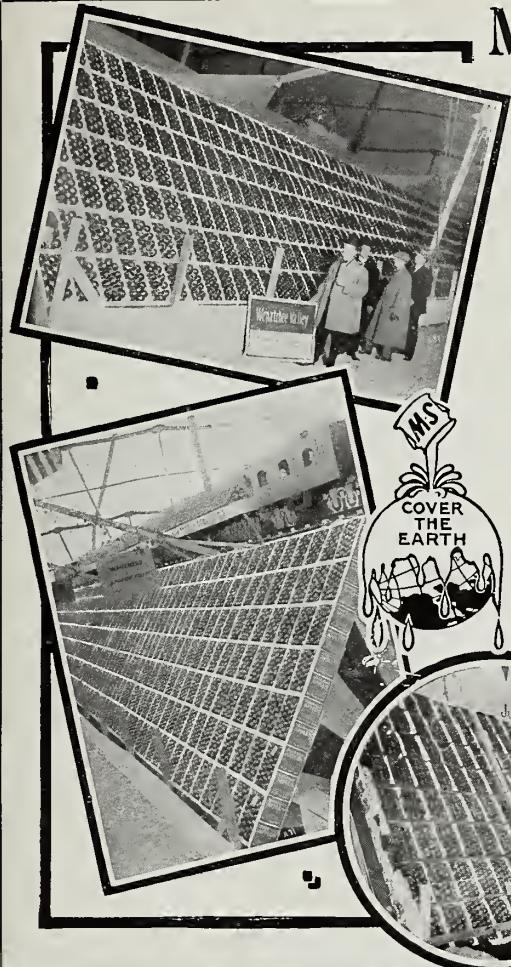
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Any power and any capacity of pump from 100 gallons to 12,000 gallons per hour—air tight steel storage tanks from 200 to 20,000 gallons capacity.

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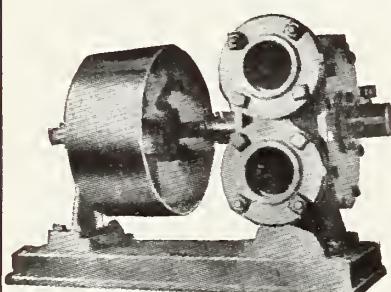
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Saves power and money; utilizes the power and converts it into results; high heads without staging; surface use, or wells, pits, mines or reservoirs; mechanical perfection; simplicity; easily installed; free from usual wear; adjustable to take up wear; strong, compact, positive, faithful and efficient machine. Costs more because worth more, because it saves more than it costs over other machines. Many sizes: 10 gallons per minute to 1,000 gallons per minute, \$30 to \$625. Address

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Fall 1912 = Spring 1913

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Our Leader—a fruit tree with a one-year-old top and a three-year-old root

An opportunity for a salesman to avail himself of a good income and a course in the Pacific Horticultural Correspondence School.

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Hood River by its scientific apple growing has produced apples of such quality that they command the highest prices and are known in every market in the world.

It has specialized on a few varieties and developed them to perfection. From this stock, the most highly developed in the world, we have selected our scions, and now offer for sale—

VIGOROUS TREES, WELL ROOTED, TRUE TO NAME, AS FOLLOWS:

**Spitzenberg, Newtown, Ortley,
Arkansas Black, Gravenstein**

We also have a good selection of the other good standard varieties grown in the Northwest.

Our stock is the best. Please write us for quotations. You will find OUR PRICES ARE RIGHT.

Hood River Standard Nursery, Hood River, Oregon

Stark Delicious Apple Again

Smashes All Records in 1911

Leads every variety in Wenatchee Fruit Growers' Association List for 1911.—F. S. Burgess of Chelan County, Wash., makes \$882.93 net from 36 ten-year-old-trees

Again, yes again, Stark Delicious has proven its claim to the title of "biggest profit-producer among all apples." For in 1911 it has again outclassed everything in the apple line by the big prices it brought its growers, just as it did in 1910, 1909, 1908. Spitzemberg, Winesap, Jonathan, Newtown—all of them, and the best ones, too, fell \$1.00 per box or more behind this wonder apple in selling price.

And think what that extra dollar means to the season's profit on the crop.

Tops Wenatchee Ass'n List

Here are the prices made public about January 1st, of the Wenatchee Fruit Growers' Association, one of the strongest fruit growers' organizations in the West:

Stark Delicious	\$2.75	Grimes Golden	\$1.35
Stark Black Ben	1.24	Winter Banana	1.50
Ben Davis	1.00	Stayman Winesap	1.41
Senator	1.35	Jonathan	1.44
Black Twig	1.26	Rome Beauty	1.44
W. W. Pearmain	1.32	Spitzemberg	1.80
Stark King David	1.40	Winesap	1.80

These figures, Mr. Fruit Grower, tell a story of big, vital importance to you. We can't add a word that would make it stronger.

\$882.93 Net Profit from 36 Trees

Stark Bro's, Louisiana, Missouri—Dear Sirs: "On December 18, 1911, you asked me for a report on my crop of Stark Delicious from my 36 trees, 10 years old. It was impossible to make a report at that time, as I did not have full returns until the present date. The report will not be so good as last year, but it is good considering the general short crop in this valley this year."—F. S. Burgess, Chelan County, Washington, January 22, 1912.

"Report of crop of Stark Delicious for the year 1911; 36 trees (10 years old) set in square form, 20 feet apart each way.

263 boxes Extra Fancy, at \$2.33	.....	\$612.79
58 boxes Fancy, at \$2.08	.....	120.64
87 boxes 'C' grade	.....	149.50

\$882.93

"These prices are net—all freight, warehouse and marketing charges have been deducted."

(Signed) F. S. Burgess,
Chelan County, Washington.

\$1,500.00 Net Profit Last Year

In the fall of 1910, from these same 36 Stark Delicious apple trees (then 9 years old), Mr. Burgess harvested a crop that netted him \$1,500.00.

—\$2,382.93 net from two successive seasons' crops, or \$33.10 net per tree per crop! And these 36 trees occupy only one-third of an acre of ground.

If you are interested in the business of fruit growing for the profit there is in it, we cannot give you better reasons why you should plant Stark Delicious than these true records. We have hundreds more of them—they all tell the same story of big profits—bigger profits than any other variety has ever earned.

Our Prices Lowered for 1912

Because our volume of business on Stark Delicious has been tremendous we offer for Spring 1912 trees of this world-famed variety at 10 cents per tree cheaper than last year.

The enormous demand for Stark Delicious trees has made it possible for us to grow them in greater quantity (more than 3,000,000 propagated for 1912 trade) and better quality than ever before, and thus lower the cost of production. You get the saving.

These low prices are subject to 25% discount for cash with order.

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2 to 3 feet—		
Each	.30	100.....\$ 23.00
10	2.70	1000.....180.00
3 to 5 feet—		

Each	.10	100.....32.00
10	3.70	1000.....265.00

TWO-YEAR TREES

X. 3 to 4 feet—		
Each	.30	| 100.....\$ 23.00
10	2.70	| 1000.....180.00

XX. 4 to 5 feet—		
Each	.40	| 100.....32.00
10	3.70	| 1000.....265.00

XXX. 5 to 7 feet—		
Each	.50	| 100.....40.00
10	4.50	| 1000.....330.00

300 trees or more are sold at the 1000 rate.

30 trees or more are sold at the 100 rate.

10 trees and less than 30 are sold at 10 rate.

Less than 10 are sold at the Each rate.

Don't You Pay Freight

Let us do it. We pay freight on orders of \$10.00 net or more. We also box and pack free. The Stark Method of Packing is world-famous—it is so good that we guarantee safe arrival.

Don't Delay Ordering

As mammoth as our stock of Stark Delicious trees is, it is not going to supply the demand. There are bound to be some planters, who delay ordering till the last minute, who will be disappointed. Orders are piling in now every day that keep our great force on the jump. You can't lose anything by ordering immediately. On the other hand you gain. Early ordering means perfect trees, carefully selected, carefully packed, and delivered at your station the day you want them.

8 Mammoth Nurseries in 6 Different States

It is a proven scientific fact that no one soil or climate will grow all kinds of trees to the height of perfection, and

since the Stark standard of tree quality demands that every tree be as perfect as it can be grown, we have eight great nurseries in six different states.

Eighty-six years of tree-growing know-how is back of every Stark Tree. Four generations of Stark men, scientists and expert horticulturists all of them, have devoted their lifetime to this one business. Better trees than Stark trees cannot be grown.

Don't make the fatal mistake of planting trees of questionable quality. Plant Stark Trees, with an 86-year reputation for dependability behind them. Then you can never be disappointed.

Remember, These Are Exclusive Stark Features

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- Freight paid on orders, \$10 net or more.
- Free boxing—free packing.
- Guaranteed safe arrival of trees.
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- Free books.
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- Three-quarters of a century reputation for square deal behind every Stark product.
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BETTER FRUIT

AN ILLUSTRATED MAGAZINE PUBLISHED MONTHLY IN THE INTEREST OF MODERN, PROGRESSIVE FRUIT GROWING AND MARKETING

The New Agriculture—Farming With Dynamite

From the Philadelphia Sunday Record

AT last the American farmer has found a new way of raising better crops. He has put dynamite to an agricultural use. With dynamite he can blast stumps and boulders from his land, he can drain marsh land and make it usable, and he can improve the earth so by shaking it up and making it porous that trees, grain and vegetables grow with phenomenal rapidity. This new agriculture science has been used extensively for only two or three years. At first the farmer was dubious and afraid of dynamite. He considered it a dangerous explosive, used only by anarchists and safe-breakers. But the more progressive members of the agricultural fraternity tried the "new-fangled scheme" and found it good. Crops were doubled to the acre, trees planted in dynamited ground spread their roots through the loosened earth, drank in the moisture and nourishment and thrived wonderfully.

Experiments were made with corn and other vegetables planted at the same time in fields side by side, one of which had been dynamited, the other only plowed. The product in the dynamited ground soon outstripped the other.

Last year 250,000 American farmers used dynamite. This year the experts tell us 500,000 farmers will use it. Knowledge is growing. Consequently a new profession has sprung up—that of the professional blaster. Many farmers want their fields dynamited, but don't care to handle the explosive themselves. They would rather employ an experienced man, skilled in the use of dynamite, to do the work for them, even if it does cost a little more. The professional blaster is a man used to handling dynamite, who knows how to explode it in a way that it will do the most good and no harm. He frequently goes about the country, advertising his coming beforehand in rural newspapers. Often he branches out, becomes a contractor and has several crews of experienced blasters under him. There are a great many more young men learning agricultural blasting in this country today than there are learning to build aeroplanes. Dynamite, while a dangerous explosive, is not half as dangerous as most persons think it. Handled by a skilled person who is used to it and knows how to take the proper precautions, there is little or no danger. Anarchists, as a matter of fact, do not use dynamite in bomb throwing, and neither do burglars use it in "cracking" safes. What they use is nitro-glycerine. There is an erro-

neous and widespread impression that a dynamite cartridge will explode if dropped on the ground or thrown against the body of a person.

Of course, dynamite has the power to injure—so has a shotgun or gasoline or a spirited horse. Out of 500,000 regular users of dynamite throughout the country in 1910, including miners, quarrymen, contractors and farmers, there was a casualty list of less than one-eighth of one per cent. This low accident record is due to the careful following of instructions put out by all manufacturers of dynamite. The ordi-

joined together by a platinum wire finer than a thread. When the electric current passes through the fuze it makes the platinum wire hot enough to detonate the explosive in the copper cap. When more than one charge of dynamite is to be exploded at the same instant the blasting is done electrically. The electric fuze wires are then joined by connecting wires and the charges are exploded by an operator some distance away.

The great advantage of an explosive is that it does instantly as much work as a man, or even a machine, could do in many days, and in some instances it secures results not obtainable through any other agency. Some years ago it was thought that the only use for explosives on the farm was for splitting stumps so they could be dug out more easily. Even then the work was not done in the right way. The dynamite was placed under the stump in such a way and in such small quantities that when the explosion came roots were left in the ground which later sprang up, causing trouble for the farmer. Later it was discovered that the cheapest and quickest way of getting rid of stumps of any size was to lift them out completely from the ground, roots and all, and reduce them to firewood at one operation. About the same time it was decided by many enterprising farmers that it was good business policy to blast out boulders and plant the ground they occupied rather than plow around them. Soon after ditches were being created in a flash in practically any kind of soil. Fruitgrowers began preparing their orchard grounds with light charges of dynamite, and by breaking up hardpan and other impervious soils thousands of acres of land previously thought worthless have been made to bear good crops. But while it took some time for most farmers to find out in how many ways dynamite could be utilized, there were a few who by the merest accident stumbled on the information and put it to use years ago. Probably the first known user of dynamite in actual farming was a California farmer. He planted an orchard with the aid of dynamite about twenty-two years ago. This orchard matured more rapidly than orchards set out with a spade, resisting drought and other unfavorable conditions with marked success.

Two years later another farmer in Georgia noticed how much more luxuriantly his crops grew in the parts of the land where stumps had been blasted from the ground. He decided to try

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FARMING WITH DYNAMITE

SYSTEMATIC CULTIVATION OF PEACH ORCHARDS

INFLUENCE OF ENVIRONMENT ON DEVELOPMENT OF PLANT DISEASES

PRACTICAL VALUE OF PEST CONTROL

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CARE AND MANAGEMENT OF ORCHARDS

(Continued from last issue)

nary dynamite cartridge, used for the most part, is eight inches long, one and one-quarter inch in diameter and consists of a paper shell enclosing the explosive, which looks like brown sugar. For different kinds of blasting, however, different kinds and strengths of dynamite are used. When dynamite explodes a small mass of explosive is changed to a large volume of hot gases. Small copper cylinders called detonators are used for the exploding. They are of two kinds, one known as a blasting cap, the other as an electric fuze. The heat to detonate a blasting cap is provided by the spark from a piece of fuse, one end of which has been pushed into the open end of the blasting cap, and fastened there by squeezing the blasting cap on it with what is known as a cap crimper. When the other end of the fuse is lit it burns slowly through and when the fire reaches the blasting cap it explodes. Electric fuzes have two insulated copper wires sealed in the cap. The tips of these wires in the cap are bare and



Corn raised from dynamited ground on the left; that from ground not dynamited, on the right

the experiment of loosening up the earth before planting peach trees. He found that he gained two years in six with the trees planted in dynamited ground; in other words, the trees planted with dynamite yielded as much fruit at the age of four years as most trees did at six years. He then tried the experiment with watermelons, corn and cotton, and found that in each case the new method brought good results. Still another man, a few years later, noticed how luxuriantly grass and clover grew on land adjacent to quarries where blasting had been done. Thus he learned the secret. It is in the spring of the year that much of the blasting is done? As the time for planting approaches hundreds of farmers in Pennsylvania, New Jersey, Delaware and Maryland are busy making the arrangements for this new form of deep tillage. The plow is still used, of course; it is one of the oldest and most useful of farm implements. But the farmer has discovered that there are a great many things the plow will not do. To plow is like "cutting a cake of butter with a sharp knife," as one farmer remarked. "The cut surface is left hard and smooth." It rains, the water soaks through the top soil and then follows the course of the plow, soaking no farther. But in sub-soiling with dynamite exactly the opposite condition prevails. The ground is "heaved," shaken and broken many feet deep, and is left so open and porous that all the rainfall is absorbed and retained. This is given back as growing crops demand it.

Scientific farming is now taken very seriously by every progressive farm owner. The successful farm of today is a splendidly systematized institution, and its owner is a practical business man who uses modern methods of accounting, modern machinery and the latest discoveries by government agricultural experts in preparing his soil, selecting his seed, cultivating his land and harvesting and marketing his crops. It is, therefore, inevitable that so valuable a commodity as dynamite should become more widespread in its

use as the years pass. There is no section of the country where it may be said to be used most. On the farms about Philadelphia, in New England, the South and the Middle and Far West dynamite is helping the farmer. Numerous prominent men have made a study of its advantages. "The good work of blasting the compact sub-soil and hardpan is moving along in the East as well as in the West," says Ex-Governor Samuel J. Crawford of Kansas. "If the sub-soil is loosened so that the rainfall can penetrate the earth the roots of grain, grasses, trees, and so forth, will follow the water to their natural depth and draw their nourishment from five to six feet of soil instead of five or six inches of surface soil, as heretofore. Besides, the blasting creates sub-reservoirs in which to store surplus rainfall which will supply the roots of growing products with moisture when the dry season is on. Again, if the ground is loosened so the water can pass down into sub-reservoirs there will be no standing water on the surface to damage the crops or keep the farmers back with their work. Such treatment, properly applied, will revolutionize the agricultural and horticultural industries throughout the country."

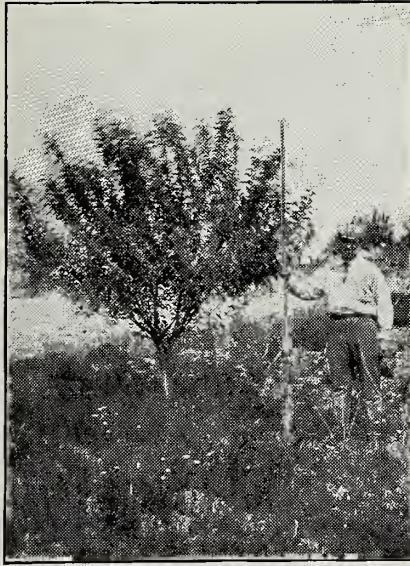
W. J. Spillman, head of Farm Management Investigations of the United States Department of Agriculture, has some interesting things to say about plant life and the great advantage of porous soil. "Plant food," he writes, "is dissolved in water. While a plant is growing a constant stream of water flows up through it and evaporates at its leaves. For every pound of increase in dry matter made by the plant from 300 to 500 pounds of water flow up through it. Plants in their growth make use of thirteen elements, nine of which they secure directly from the soil. They are phosphorous, potassium, calcium, magnesium, sodium, iron, silica, chlorine and sulphur. Soil consists mainly of small particles of rocks. Nearly all kinds contain more or less mineral plant foods. Every year the soil water dissolves off a thin surface layer from each particle and plants appropriate this water, thus securing their mineral plant food. Hydrogen, another important element of plant food, is also secured from water. In order to produce a ton of hay on an acre of land it is necessary that the growing grass pump up from that ground approximately 500 tons of water. In order to supply this enormous quantity of water the soil must not only be in a condition to absorb and hold water well but must be porous enough to permit water to flow freely through it. In addition to acting as a water carrier for plant life soil must permit a proper circulation of air through it. Nearly half the volume of ordinary soils is occupied by air spaces. Soil which becomes so compact as to stop air passage is too wet for most crops and needs drainage, for plant roots must be supplied with air and the soil must be porous enough to permit of its free circulation. One of the most important objects of plowing is to loosen up the soil and mix fresh air with it."

The disastrous dry spells of last summer have led the foremost agricultural authorities to advocate deep tillage as a means of increasing crops and avoiding the bad effects of future droughts. Crop failures not only affect the farmer, but they also cause that bugbear, the high cost of living, to loom up more prominently than ever before the city man. What might be called the natural



Tree stumps turned into kindling wood

method of deep tillage is the planting of crops such as alfalfa, whose large and powerful tap roots penetrate a rather compact sub-soil to a depth of six feet or more and in a few years render it more or less open. A more rapid method of deep tillage is with the sub-soil plow, which breaks up the soil to a depth of fifteen to twenty inches. This, however, is rather expensive and very hard on men and horses. Lastly comes the third method of sub-soiling—by the use of dynamite. Actual experiments show that cotton yields have been doubled, trebled and quadrupled by sub-soiling with dynamite. An experiment in a flower garden showed that there, too, the dynamite



Six-year-old tree planted in a spade-dug hole

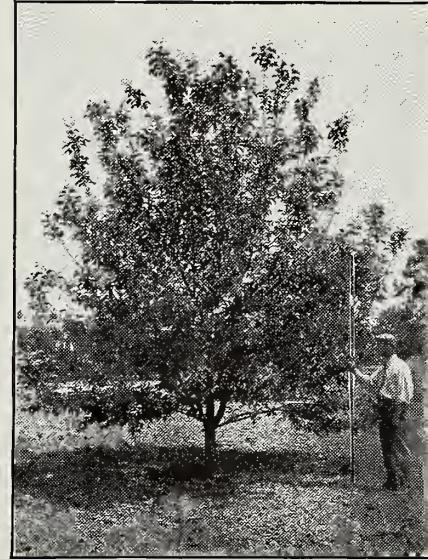
worked just as well. Hardy peony plants and other flowers bloomed profusely the first season, although before, on other ground, they had failed to bloom before the second or third year. One farmer near Anderson, North Carolina, planted four acres by the use of dynamite. Half a stick of what is known as forty per cent dynamite was used to each fifteen feet square, the dynamite being placed in holes punched in the ground and then fired. The dynamiting cost eighteen dollars an acre. The ground was stirred up from three to four feet deep. It was plowed and harrowed in the usual manner and the corn drilled. On the four acres in question more than 800 bushels of corn were harvested. In former years, without sub-soiling, they had yielded 100 bushels an acre.

In the North the best time for sub-soiling is from May to November, and in the South from October to February 1. The cost of sub-soiling by dynamite averages about fifteen dollars an acre, including dynamite, caps, fuse and the labor of making the holes and doing the blasting. In most cases the cost is recovered within the year out of the increased yield, but in other cases where the increased yield would not be worth more than fifteen dollars an acre it is important to know how long the increased production is going to keep up, so as to justify the expense. Most

soil below six or eight inches is still in its primeval condition and has never been disturbed. Chemical analyses of soils down to a depth of twenty feet show that on the average acre there are tons of plant foods which become available only when roots can penetrate to them or when ascending moisture brings them up to the roots that cannot get down. Alfalfa and other deep rooted plants are called "soil makers" because they penetrate this compact soil, introduce humus and provide a passageway for the descent and ascent of water, which carries with it the soluble, fertilizing elements; but many sub-soils are so hard that it is practically impossible for any one plant to penetrate them. Even when this is possible there is no use putting such a burden on the plant, because whatever vitality is expended in making its own home beneath the surface is subtracted from the vitality of the plant above the surface. If root growth is made easy and quick by breaking the sub-soil, then the fertilizing elements of the sub-soil become immediately available and save the energy of the plant for fruition.

The question is often asked, how long will sub-soiled land stay in good condition? It is conservative and true to say that if soil is once thoroughly shattered with dynamite to a depth of five or six feet and the principles of crop rotation are followed thereafter the sub-soil will never again get back into its primeval, compact condition. Whether or not it remains as open in the years that follow as it is immediately after blasting depends to a great extent on the continuity of cropping and the proper rotation of the crops. The effect of sub-soiling virtually is to change a farm from a six-inch layer of soil to a six-foot layer. The only element of fertility lacking in the lower five and a half feet is humus, and that will be found in the sub-soil in ample quantity after the first year's cultivation. The significance of this conclusion must be appreciated by the careful agriculturist. It does not, however, constitute a substitute for ordinary plowing. Cultivation of the top soil is always necessary, whether the sub-soil is broken or not in order to prevent the growth of weeds, loss of moisture from evaporation and the formation of a waterproof crust. The features of

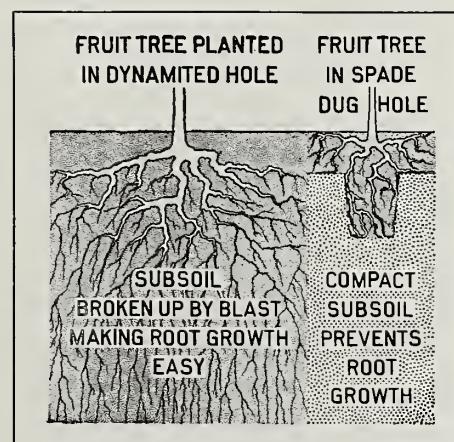
most of the important uses to which dynamite is put in farming have now been explained. In the removing of stumps, in sub-soiling and in tree planting it is invaluable. Its most spectacular use, however, is in ditching and the draining of marsh land. The efforts of the government and the leading railroads to perfect plans and methods for draining the vast area of swamp now covering millions of acres of rich, verdant soil have directed the attention of the general public toward the importance of increasing the cultivated area of the country. The importance of any farm, county, state or nation varies almost directly in proportion to the extent of its cultivated area. Many Southern States can be doubled in productive area by proper drainage of swamps and clearing of cut-over lands. The area of swamp and cut-over lands



Six-year-old tree planted in a dynamited hole

in this country is greatly in excess of the total cultivated area. Hence any means of bringing these lands into cultivable shape is of the highest importance.

It often happens that swamps and marshy lands are caused by hardpan underneath. There is no outlet by which the water can run off, and as it cannot sink into the earth it stands there, rendering the land useless and breeding disease. By using dynamite these conditions can be removed. The hardpan is usually only a few feet thick and is located several feet below the surface of the marsh top soil. With an extension auger a hole is bored to the bottom of the hardpan. Into this hole several dynamite cartridges are lowered and "tamped." The top cartridge is primed with a blasting cap. In ditching with dynamite the first thing done is the locating of the proposed ditch. Then the width and depth are decided on. Holes are punched at intervals of about two feet along the course of the center of the ditch. In each of these holes a cartridge is dropped and "tamped" in with some mud. A row of ten cartridges is made 150 or 200 feet long and only the center cartridge



is primed with a fuse and blasting cap. This method of blasting, where only the center cartridge is primed, is only used in damp and compact soil. When the soil is dry or loose the charge will not extend from one cartridge to another. Then each cartridge is primed with an electric detonator. The detonators, or electric fuzes, are connected with a blasting machine about 200 feet from the nearest charge. No matter which method of blasting is used the

spectacular part of the work comes at this point. There is a flash of flame and a sheet of mud is thrown 200 or 300 feet in the air. A few seconds later the ditch is ready for the passage of water. The dirt excavated is scattered over the adjacent land, so there is nothing to shovel. The whole distance is excavated in an instant and the first time the water goes through the banks of the ditch are all washed to a true line.

Western Tomato Blight

By W. S. Thornber, Director Lewiston-Clarkston School of Horticulture

WESTERN tomato blight causes a greater annual loss to tomato growers in the Pacific Northwest than all other tomato pests together; in fact it has become such a serious problem that many irrigated districts have ceased to consider tomatoes a profitable or safe crop to grow. The soil and climatic conditions of many of these districts are apparently remarkably well adapted to the culture of this crop, and if the blight could be avoided or even partially controlled many acres would be annually planted to tomatoes, and even at greatly reduced prices the tomato would become a very profitable crop, because it is a heavy annual bearer, and the longer fruiting season natural to these districts makes possible a doubly profitable crop.

A score of different causes have been assigned as the cause of tomato blight, and yet up to the present time no single cause seems wholly responsible for the trouble. The more common causes assigned are alkali in the soil or irrigation water, a deficiency of humus in the soil, too intense heat, hot days and cold nights, soil fungus, root bacteria, naturally weak plants, poor root systems and, finally, improper cultivation. It seems rather incredible to attribute a condition of this kind to alkali in the soil or water for the reason that tomatoes are frequently found growing under very strong alkali conditions, or that it is due to temperature conditions, as almost any market gardener knows the range of temperature that a tomato will survive. As to naturally weak plants, poor roots or improper cultivation, any or all of these may cause an unfavorable condition similar to blight, but not blight. A peculiar small root fungi, as well as a rare bacteria, is sometimes found growing on or in the diseased roots, but thus far we have been unable to produce blight from artificial inoculation, which makes us very doubtful as to either of these pests causing the blight.

Tomato blight is probably a physiological condition brought on by a peculiar behavior of our soils, and particularly on our sub-soils when under very dry, unfavorable conditions. A careful examination of the soils giving the worst results of tomato blight shows an abundance of silicate, with sufficient carbonate of lime and magnesia to form a light cement. Aside from these three other elements are found in varying amounts, none of which are

injurious to plant life. These elements act together about the middle of June, or later when the hot weather comes on, and form a light cement in the soil. This cement is not chemically injurious to plant growth beyond making the soil so hard that the roots cannot penetrate it, and so root growth ceases at once and the plant dies for lack of available plant food, even though the soil is abundantly supplied with the various mineral plant foods. This same condition affects fruit trees in a similar manner, and would kill them the same as tomatoes were it not for their perennial growth. Anyone familiar with handling these soils under irrigation knows how difficult it is to properly irrigate a tract after this condition has once taken place. It is practically impossible without the addition of organic matter of some kind to get the sub-soil to take water, and a light or improper irrigation simply means a worse physical condition of the soil. After a careful examination of hundreds of patches of blighting tomatoes the above conditions were found existing in every instance. Under various conditions of shade, board fences, mulches and furrowing, the trouble was less marked than in the open. However, none of them worked with any degree of satisfaction.

During the examination of these patches particular notice was taken of the hotbeds in which plants were started. In practically every hotbed, from a few to a few hundred plants, were left as transplants, and in no instance was a blighting plant found in the beds, but in all instances good roots were found, always extending down into the manure used to heat the bed. This gives the keynote to the situation. Then why not make a small hotbed under each row of plants in the field, or at least under each hill, and avoid the difficulty. This experiment was tried last year in two or three places on naturally bad tomato blighting soils. In one test deep furrows were plowed early in the spring and a small quantity of barnyard manure, mostly from cattle barns, was placed in the bottom of the furrow, then covered with from four to six inches of soil. The plants were later set in rows above the manure, and out of about four hundred plants treated in this manner not a single plant blighted, and all were strong and bore heavy crops of fruit. On an adjoining piece of land about

four hundred plants were set in the ordinary manner in the same kind of soil, but without the manure treatment, and ninety per cent of these plants blighted before the end of the season. Another plan that will probably work has been suggested by one of our market gardeners, and that is to place a good forkful of manure in the bottom of each hill hole before the plant is set or the seed sown. In either case the manure should be covered with at least from four to six inches of soil in order to prevent root burn; especially is this true if fresh, unfermented manure is used. Plants treated in this manner will require plenty of water, but will give splendid returns, as has been shown from our past experiences.

Government Whitewash

Laura A. James in Suburban Life

WHEN you were a country boy, and perhaps had to whitewash the back fence, as "Tom Sawyer" did, you must have noticed that the whitewash didn't stay on long. Did you ever think of what excellent quality whitewash that used by the United States government must be to stand the rough use it gets on such structures as lighthouses and life-saving buildings? Below I give the two washes now in common use by the government:

1. Whitewash for Outside Use.—Mix a half bucket of unslaked lime with two handfuls of common salt. Add soft soap in the proportion of a pound to every fifteen gallons of whitewash. Slake gradually and stir constantly. This makes a sticky and very effective wash, and one practically waterproof.

2. Whitewash for Interior Painting.—Slake a peck of quicklime with boiling water and cover the instant the water is added. Strain after slaking and put in a gallon of salt dissolved in hot water, a quarter of a pound of Spanish whiting, two pounds of rice paste and a half pound of glue dissolved in warm water. Mix these thoroughly, cover and set aside for a few days to ripen.

If this is made thin enough it may be sprayed on fences, nests, troughs, hen-coops, poultry houses and walls. If a spray pump is used two or three coats should be put on. No mice, vermin or lice can live where this wash is used.

Editor Better Fruit:

Last fall on the recommendation of the Dake Advertising Agency of Los Angeles I decided to try your publication in the interest of my crimson winter rhubarb and berry plants. I am pleased to advise you now that the returns from "Better Fruit" have been most excellent, and I am certainly glad that I decided to try your publication. Yours sincerely, J. B. Wagner, Nurseryman, Pasadena, California.

The Spokane, Portland & Seattle Railway has just issued a splendid 48-page booklet entitled, "Oregon and Washington," which in a very interesting way gives much information about the agricultural resources of the territory served by this road. We understand it is the intention to place these booklets for distribution with the commercial clubs and general immigration agents of the Northern Pacific and the Great Northern railways for their work throughout the East. These booklets will be sent to various commercial clubs or supplied upon request by addressing the Spokane, Portland & Seattle Railway Company, Portland, Oregon.



Four-year-old Spitzemberg, unpruned and pruned



Peach tree thirteen months after planting. Shows good heading and proper spreading.

The Care and Management of Orchards

By Professor C. I. Lewis, Horticulturist, Oregon Agricultural College

(Continued from last issue)

Nitrogen is the so-called vital element; without a fair amount of this in the soil it is impossible to get satisfactory growth. It is the substance which produces the vigorous green color of our trees, and gives us splendid leaf and wood growth. If used to excess it may produce too much wood growth at the expense of fruit, and the fruit may lack in color. Most of our mature orchards would probably be benefited by additions of some nitrogen in some form or other. Potash forms about fifty per cent of the ash of trees; it is found in the buds, leaves, etc. This substance gives firmness and aids in maturing and ripening the wood. It is the base of numerous fruit acids. By some people it is thought to produce the color, but this contention has never been proven. Phosphorous is one of the essential elements in the tree and fruit; it is thought to be of aid in ripening the fruit and of considerable importance in seed formation. We must keep up the supply of all three of these foods if we are to derive the best results. Lime is thought to be of value in producing hard, firm wood and in aiding trees to mature and go into the dormant state.

By cover crops we mean a crop which is planted in the late summer or early fall and grows while the trees are dormant. In many parts of the Northwest they will make very satisfactory growth during the winter. The growing of cover crops is one of the very first steps to be taken in maintaining in good vigor and heavy bearing our mature orchards, and they may be of great assistance in young orchards which have been planted on land which has been cropped for a great many years and is more or less run down. All the cover crops are of value in, first, that they add fiber. This fiber allows us to keep the ground in better physical condition and prevents the ground from becoming lumpy and hard to till; it makes light soils heavier and heavy

soils lighter; to a large extent it prevents puddling, and on hillsides may prevent washing and extensive seepage. It aids us to till our lands earlier in the spring than would otherwise be possible. Many of these plants have the ability to take nitrogen from the atmosphere, making it available for plant growth. In growing cover crops we must make a study of the crop to be used, the climatic and soil conditions, seasons, etc. As far as crops are concerned we can make several classifications. First, nitrogen gatherers. These have the power of taking nitrogen from the air, and when they decay in the soil to set free this nitrogen to be used for plant growth. This nitrogen is found on the roots of these plants contained in the little nodules on such crops as clovers, beans, peas, vetch, etc. These plants, then, are of especial value, since they add this vital element—nitrogen—and at the same time furnish an abundance of fiber. The second class make potash available. Upon their decay they set free a large amount of potash which the trees can use. These crops include cow horn turnips and rape. The third class of crops are principally valuable because

they supply humus to the soil and thus give an abundance of fiber; they include such crops as rye, oats and weeds of various kinds. If we are to make a success of growing cover crops we must put them in the ground at the right season and in the right way. The best time is to plant the seed the latter part of August and not later than early September. It is much better to thoroughly drill them in than to sow them broadcast and harrow in. Last season, at this station, in one of the driest summers we have experienced we germinated cover crop seed in six days, and when the first fall rains came these crops took hold vigorously. Many people make the mistake of planting seed too late, planting in the latter part of September and early October. Under such conditions the plants do not get sufficiently large before the fall frosts come, and as a rule make unsatisfactory growth if subjected to heavy frosts and rains.

The next main point is the proper time to plow under. As a general rule I would advise one to plow the cover crop under at the time one would naturally plow the orchard if it had no cover crop. In many cases where the cover crops are allowed to grow late in the spring such growth may be at the expense of the trees, as at this time the former are pumping out increased amounts of moisture from the ground, and should you have a dry spring this loss of moisture might be felt by the trees. Again, it is never wise to leave cover crops that contain materials such as rye and barley to grow very high or become tough, for when such material is plowed under it will decay very slowly, and under some conditions it would be almost impossible to hold moisture between this layer of undecayed material and the surface. As a result the ground might dry out exceedingly, and instead of the trees receiving benefit from the cover crop they would experience a checking influence for that season at least. In many of our



Four-year-old Baldwin showing effect of summer pruning. Tree heavily loaded with fruit. Companion trees of same variety and unpruned the previous summer have no fruit. This tree has been slightly overpruned.

hill lands where cover crops have not been grown the growth the first few years is very discouraging. Nevertheless I would plow the ground at the proper time in the spring, and experience has generally shown that the cover crops grow well after a few years' trial, becoming better each succeeding year. The proper time for planting the seed and the proper time of plowing under the cover crop is one that the growers generally do not observe carefully enough. In many cases one can disc under the cover crop, and probably this method would have to be used in many of our orchards. Where the cover crop is becoming very rank in growth one can assist in working it under by using a coulter when plowing, or often by chain drags.

The amount of seed to sow per acre will vary considerably with various conditions. The more heavy and shaded the orchard the more seed will be necessary. On land to be planted with young orchards that is in great need of cover crops, such as land that has been in wheat for a long time, one will have to plant heavier cover crops than would otherwise be required. One bushel of rye to the acre and a bushel of vetch drilled at right angles to the rye has given very satisfactory results. The following amounts of seed are those we generally recommend to try per acre: Rye, 10 pounds to $1\frac{1}{4}$ bushels; vicia sativa, 40 pounds to 60 pounds; vicia villosa, 40 pounds to 50 pounds; oats, 20 pounds to 50 pounds; Canada peas, 100 pounds; rape, 10 pounds; cow horn turnips, 2 pounds;

cow peas, 100 pounds; soy beans, 10 pounds; crimson clover, 20 pounds. As far as Western and Southern Oregon are concerned vicia sativa is the most satisfactory crop of the nitrogen gatherers to grow. In a few unusual years, when the winter is a little more severe than common, the vicia villosa makes better growth, but the vicia sativa is more to be desired under ordinary conditions. We have found it a good practice to drill vetch and rye together, as the rye seems to serve as a nurse crop and holds up the vetch. In some cases oats can be substituted for rye; rape and cow horn turnips do fairly well in this district. We are conducting experiments at the present time to determine which crop is stronger. In Hood River both sativa and villosa have done well; however, in some districts even there sativa is preferable to villosa. In some sections, especially in those that experience a great deal of cold weather, the villosa is the best crop that we have tried. The chances are that in those orchards in which vetch or similar crops make rank growth it would be unwise to use such a crop every year; probably three years out of five would be sufficient. Clean culture could be practiced every two years, though crops like rape and cow horn turnips might be used. In most cases where the trees are making as much of a growth as one should desire but the ground is hard to manage, either baking or becoming lumpy on the one hand or too light and easily blown by the wind on the other, the growing of such crops as rye, barley and oats, to be plowed under later, would probably aid

materially in the ease with which such soils could be handled.

The general principle to be observed in growing the cover crops is simply to maintain the trees in good vigor and health and at the same time to get good crops. While in the majority of our orchards there would be little danger for a number of years at least of growing too many crops of vetch, nevertheless I would not advise the continual use of such crops in orchards that already have vigorous foliage and are making a large wood growth. In many of our orchards trees will need slight checking at times in order to bring them into proper fruitfulness. This is especially true of trees from nine to twelve years of age that have been put on very rich soils, and which are either being irrigated or are receiving considerable sub-irrigation waters. Each grower must study his individual orchard carefully and feed the trees according to their individual needs. One will often find that the variety and age of the trees will determine the treatment the orchard should receive. Our growers need to study the individual varieties more, and even the individual trees. It is well to have definite plans made of the orchard, either working according to age or variety, keeping the trees accurately outlined or designated in such a way that one can note the degree to which such trees are fruitful and making a satisfactory growth. In many cases the individual trees should be given more attention than they are now receiving. A system of plotting the orchard and keeping records need not



Prune tree before pruning



Same tree pruned



Peach tree one year after planting, unpruned



Same tree after pruning

be laborious, and if properly done should tend to materially increase the income from the orchard. Our orchardists must learn to study their individual trees in the same way that the dairyman studies the individuals of the herd. Especially is this true as related to such subjects as feeding the trees, pruning, thinning, etc., and the treatment for various pests.

The term shade crop is used to designate those crops that are grown in the orchard during the growing season, the aim being to supply food and give the same benefits, to a large degree, that we are receiving from the use of cover crops. The shade crop is adapted to irrigated districts only, as far as mature trees are concerned at any rate, and should only be attempted where one has sufficient irrigating water to grow both the trees and crop successfully. The shade crop is being used quite extensively in parts of the inland empire, as the Payette Valley and the Walla Walla Valley. There are a great many crops being tried; the best ones to use, however, have not been thoroughly determined. The clovers, where they will grow successfully, offer one of the best crops to grow. They are handled in a number of ways. In most cases the crop is grown for two years, being mowed two or three times each year, and is then plowed into the ground and clean culture practiced for the first year or two. The other method is to cut the crop, allowing one crop of clover to go to seed, and then discing the crop under each year, the crop reseeding itself. In some cases alfalfa is being used, but it is a questionable

practice. It is yet to be determined whether or not it is a desirable practice to grow alfalfa or any other crop in an orchard for a number of years without discing or plowing deeply; such a practice might cause roots to come too near the surface, and when plowing was undertaken, if it became necessary, it might be disastrous to the trees. Shade crops are very desirable in those districts where the soil becomes excessively warm and where there is a great deal of reflective light and heat. They shade the ground, tend to make it cooler and furnish a large amount of plant food. Whether it is desirable to plant young trees with shade crops is yet a question and needs to be experimented with more. We do know, however, that young trees will grow well where there is a strip cultivated each year on each side of the tree and a shade crop grown between the trees; later the crop may be allowed to grow over the entire ground.

Another method of maintaining the orchard fertility would be by means of manures or commercial fertilizers. Probably well rotted manure is one of the best materials to apply to orchards; however, this is scarce and at times too expensive. Under average conditions one could not afford to pay over one dollar a load for average manures. In very light soils one should avoid applying a very large amount of very strawy manures, as the straw decays slowly and may do more harm than good, causing the soils to dry out rapidly. The time may be close at hand when it will pay in some of our orchards to use commercial fertilizers. While many

growers would hate to admit that such a time is here, or will come in the near future, all sentiment will disappear when it is demonstrated that an application of fertilizers will pay big interest. In all cases I would advise one to take up the application of fertilizers in a conservative way. Each orchard can become an experiment station and demonstrate the needs of plant foods. In purchasing fertilizers two points should constantly be kept in mind; one is the actual amount of plant food the fertilizer contains and how much one is to pay per pound for such food, and the other point the availability of this plant food. Some fertilizers cost more per pound of actual plant food at twenty dollars a ton than others that sell at fifty dollars a ton. Bulletin 79 of this station has dealt with this subject very nicely. In applying commercial fertilizers to the orchard I would choose a few trees; apply some quickly available nitrogenous food, such as nitrate of soda or dried blood, applying nitrates at the rate of 50 to 100 pounds per acre. Choose a few more trees and apply acid phosphates at the rate of 300 pounds per acre, or super phosphate at the rate of 100 pounds per acre. Muriate or sulphate of potash may be applied at the rate of 100 to 200 pounds per acre. Then make combinations of some of these and make a complete application. If the trees respond to such applications it would probably pay in many cases to use such fertilizers. Later on, in applying fertilizers, one may wish to mix some of the more slowly available ones with the quickly available fertilizers; this

should be applied in the spring and be plowed under or harrowed into the ground.

The mulching of orchards with straw, grass and similar substances has been tried in several parts of the country with more or less success. This experiment station is conducting a series of experiments along this line. We are not ready to publish as yet, but I will still advise growers to practice cultivation with either the cover crop or shade crop wherever possible. Combining fruit growing with some industry as poultry husbandry, dairy husbandry, hog raising, etc., would probably keep up the fertility of the land, and while this would be practicable with young orchards before they come into bearing in the majority of commercial bearing orchards it would not be practicable, since it divides one's time too much, and there are few men who can make a success of several specialized lines. Generally they will neglect some of these lines in order to perfect the other. Again, with land worth from \$1,000 to \$2,500 per acre, one could not devote much ground for general farming purposes. There is undoubtedly a field for combined fruit growing with diversified farming on a small scale, and many people are making a very good living from such combinations.

Irrigation in its relation to fruit growing is a subject which the department of horticulture is investigating, and bulletins will be published from time to time on this subject. Irrigation properly handled, in many cases, will assist in producing very desirable crops and tree growth. Theoretically

irrigation should bring about the same results as proper rainfall. Unfortunately, however, the average man abuses the practice and over irrigates in order to produce a large crop, and often detracts from the fine quality of the fruit by such practice. He is apt to produce fruit of poor quality and inferior for shipping and keeping. In districts with less than twenty inches of rainfall irrigation can become a great help, and in many cases is a necessity, especially with such fruits as the apple. In regions with a slightly greater rainfall than this it is of help in keeping the trees in good healthy condition and in tending to produce annual crops. In irrigation the problem is to see how little water to use instead of how much. Irrigation must go hand in hand with cultivation. Under most conditions about two irrigations during the growing season are ample where the ground is thoroughly moistened and followed by intensive cultivation. Generally irrigation can be given in the latter part of August of sufficient amount to produce a good crop of fruit and prevent heavy dropping. One should avoid using large amounts of water near the time of harvesting, as this has a tendency to keep the trees in active growth and may have a bad effect on the fruit, especially with such crops as peaches. It is poor policy to irrigate peaches within three weeks of picking time. Heavy irrigation with young orchards may increase winter killing. Extensive late irrigations with bearing trees may retard color, and even interfere with final developments of high color. Where irrigation is practiced one needs to look after

the drainage very carefully, as a great deal of seepage water results, and many fine orchards have been ruined by such water.

Pruning is one of the oldest of orchard practices and is a very essential one. While it has been thought by some to devitalize some plants, proof of this is unfounded. On the contrary, it generally tends to increase vigor, which is one of the principal aims of pruning. Our objects in pruning may be stated in the following way: To increase vigor of the plants, to make them fruitful, to aid in such orchard work as thinning, spraying and harvesting, to regulate the amount of light and heat which may strike the plants, thus reducing injury from sunburn, etc.; to train plants to some desired form and, unfortunately, in some cases to get a supply of fire wood. In studying pruning we must become acquainted, however, with the general principles, and must make a special study of buds, much more study than the average grower gives to this vital topic. Concerning some of the general principles I may state that in many cases heavy top pruning has a tendency to produce heavy wood growth and rejuvenates the trees. Heavy pruning may develop strong growth of watersprouts, which indicates lack of equilibrium or balance between the roots and the top and often causes one part to live at the expense of another.

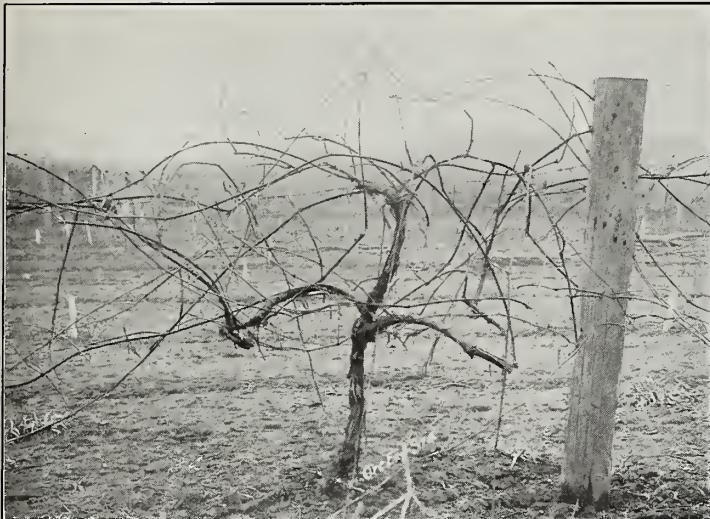
The habits of trees vary greatly; not only does the tree vary in habit of growth from youth to old age but there are many variations in shoot growths. Many have a tendency to grow from uppermost buds. These uppermost buds



This kind of pruning is never permissible. Always cut close to trunk and make a smooth wound.



The beautiful wild Oregon grape



Grape unpruned



Same grape pruned to four arms

tend to produce very strong terminal growth, which, when headed in, produces laterals. Fruit bearing tends to become a habit with trees, and can be greatly modified or changed with pruning. Summer pruning, if done at the proper time and moderately, may tend to produce fruit buds, while winter pruning tends to make wood growth. The relation of leaf and fruit buds and their differentiation is a large topic in itself, and is being investigated by this station at the present time. It will pay every grower to pay more attention to the bearing buds of his trees. With apples and pears, for example, he will find that some varieties will be annual bearers, while some will bear only once every two or three years. Some produce fruit on the end of last year's terminal growth, others bear on axillary buds on last year's growth; some produce from one-year-old spurs, while some will not produce until the spurs are several years of age. On trees in foliage one will generally find the new wood bears leaves singly, while the old wood bears in clusters. The new growth generally arises from terminal or strong lateral buds. The terminals may produce fruit, but this generally develops from the laterals. If one studies buds carefully he will find there are several kinds. Some produce fruit only, others produce both fruit and foliage, others develop into a fruit spur, while others remain dormant and never start unless the tree is injured. The terminal bud is apt to be the strongest, the first lateral next and so on down the shoot. When spurs bear fruit one year they are apt to develop shoot buds the next year, hence the habit of bearing once in two years. Fruit spurs are often forced into shoots by heavy pruning, especially at times of light cropping. However, when a branch becomes a fruit spur, so to speak, it is apt to maintain this habit unless the tree is excessively pruned. With apples and pears we have mixed fruit buds, that is, leaves and flowers on the same bud; while in some fruits like the apricot, cherry and peach, for example, certain buds contain only leaves and others only flowers. With many of our

stone fruits the fruit buds are found laterally in the axils of the leaves. The peach always bears on one-year-old wood; the buds appear singly with a branch bud, or in pairs with a branch bud between them. The position of the buds will depend largely on the vigor of the tree. The stronger the wood the nearer the tips the buds are formed. With cherries we rarely find many buds on the strong growing new wood, the greater part of the fruit being borne on fruit spurs. These spurs are generally new growth, and often bear axillary buds and terminal branch buds.

The majority of our growers favor the low tree, that is, with head formed from eighteen to twenty-five inches from the ground. In many cases one is apt to lose less trees from sunburn where headed low and properly handled than otherwise. There are several types of trees being grown, and much heated and often worthless discussion is held concerning the respective merits of the open or vase tree versus the pyramid or leader type. A third type is a combination of the two, where the leader is allowed to grow for a few years and then held in check. We should be more interested in the general principles of pruning than in the growing of an exact type. Good, strong, heavily bearing trees can be produced by all systems, while on the other hand, very weak, worthless trees can be produced by each. The so-called open or vase tree was introduced from California, where they were obliged to head the trees low and shear the tops to protect from the sun. Here in Oregon we do not shear the tops of the trees, but still try to encourage the open trees. Many people have made a mistake in thinking that a short trunk means a low head. This has little to do with the head of the tree unless one practices proper pruning the first five years of the tree's life and always gives the tree plenty of room for lateral development. Concerning the open versus the center tree, both will be used according to the type of tree we are growing. Undoubtedly all varieties that tend to grow large and rangy should be grown as open trees, while

many varieties like the Yellow Newtown, for example, which often makes a weak, scraggly growth, can be made stronger and larger, and be made to produce more by growing a leader for a number of years at least. Those who are using the open tree need to modify it considerably in the majority of cases. They are allowing most of the main branches to issue from the same point, with a resulting weak tree which breaks badly and is often short lived.

Head from eighteen to twenty-five inches; some prefer to head at twenty-five inches to get better distribution of branches. This can be done and still keep the head as low as the average tree that is headed as low as eighteen inches. The tree should be studied very closely during the first growing season; some buds will need to be rubbed off, others pinched back, the aim being to grow a well balanced tree, with as much space as possible between the branches. The branches will never grow any farther apart than the distance at which they are started, and in fact never get higher from the ground. If one leaves trees alone during the entire growing season the chances are he will find all the branches growing near the cut and a weak tree will be the result. At the end of the first year leave from three to five branches, and head these back, under average conditions, to stubs ten to twelve inches in length. Remove all laterals other than these. I would not advise heading closer than this, as it would tend to throw future laterals too close together. At the end of the second year you will find that each of these branches will have produced from one to a dozen or more laterals. I would advise choosing two of the best located and removing the rest, heading these back to stubs ten to fifteen inches in length, and either removing the remaining laterals or cut back some of these to two or three buds. These will later form fruit spurs. I may state, however, that where blight is prevalent it is poor practice to form fruit spurs too low down on the main branches. From this time we will have to modify pruning somewhat, as every time we

head in a terminal branch we force out more main laterals. It would be very easy to grow a brush heap every year, and as a consequence be obliged to practice very severe pruning annually. I have observed, especially with Yellow Newtowns, that heading in strongly, as is often practiced, is too severe, and as a result the trees are often kept from heavy bearing until ten or twelve years of age. Where terminal growth tends to become too strong it will need heading back to produce a sufficient number of strong laterals; this is true of such varieties as Northern Spy, Ortley and King of Tompkins County. One can do this to good advantage by pruning at two seasons of the year. Remove the excessive laterals and practice moderate heading back in the winter, and follow this by moderate heading back from the first to the middle of July. As the apple tends to come into bearing one should practice light annual pruning, and avoid if possible such vigorous pruning as to produce watersprout growth. With young trees the pruning should always be delayed until growth is about to start in the spring, as by this method there is apt to be much less die-back. Avoid handling trees when they are frozen. Where trees have been neglected for a number of years it is better to get them into shape gradually, taking several years, rather than to prune excessively, as excessive pruning tends to force fruit spurs into wood growth, and it may be four or five years before you can bring the tree back into proper bearing. Where heading back is necessary on large trees one often gets less watersprout and shoot growths where the heading back is just above a strong lateral. When watersprouts start to grow vigorously they should be removed immediately. In thinning out laterals always choose the stronger. All the decayed branches should be removed. In cutting off branches remove these as near the body as possible. Make an undercut some distance from the tree at first, so when the branch crashes to the ground it will not rip the tree. All large wounds

should be painted or waxed. Trees that tend to bear every year will stand more pruning than those that bear once in two years, and the latter class will stand more pruning in the bearing year than otherwise. There will be little difference in pruning the open and center tree the first two or three years, but from that time on the center is allowed to have a slight lead over the remaining branches. Some of the strongest trees that I have seen in Oregon have been produced by maintaining this leader for a number of years and not allowing them to develop further.

The same general principles that apply to the apple are suited to the pear. The pear will stand very low heading, generally lower than the apple. I would, however, advise growers as a rule to try and allow more distance between branches than they now practice. This will mean slightly higher heading. Most growers prefer an open tree to the center tree, as it is less liable to loss from blight. I will state that a tree that is grown with well spaced branches may be subject to less disease loss from blight than those where the branches all center at one point. The pear will often stand more wood than the apple, and it spreads more proportionately when heavily laden with fruit. Color is not as greatly desired as with most apples, and spurs are encouraged and allowed to grow more closely together. The first three years the pruning should be very similar to that of the apple, making an intelligent choice of laterals. With such varieties as the Bosc and Winter Nelis considerable care is necessary to get a well balanced tree. Amateurs often become discouraged with these varieties the first few years, but they will give less trouble as they become older. Staking will aid very materially in maintaining a well balanced tree. The Anjou will stand more severe pruning than most varieties, since this variety has a tendency to produce a very large number of blooms, but at times sets very little fruit. This is not caused by poor pollination, but frequently by lack of vitality. Heading

in often overcomes this difficulty. After the pear comes into bearing one should avoid pruning in such a way as to produce extra sappy growth, as such growth is easily injured by blight. Prune annually and head back occasionally to strengthen the laterals. Avoid allowing trees to grow a number of years without pruning, for in the meantime they get too rangy, and when headed back uniformly severe the result of such heading back is to produce a large amount of rank soft growth that by the time it comes into heavy bearing has carried the tree as high as formerly, and you have gained nothing from such practice.

Summer pruning is a subject in which our growers are becoming more and more interested. It is a topic of which we as yet know comparatively little. This experiment station has done some work along this line, and we are at present conducting experiments that will be of interest to the growers. In a general way, in Western Oregon, we believe that the best time for summer pruning will be from the first to the middle of July; if summer pruning is done too early it will probably defeat its aim, and will produce additional shoot growth rather than tending to check the trees and cause the formation of fruit buds. If done too late it forces out soft growth which kills badly. One must remember that it is very easy to overdo summer pruning, and there is a tendency at the present time to prune too vigorously. Severe summer pruning has much the same effect as severe spring pruning. Where practiced moderately very good results may be obtained. I would advise all growers to use summer pruning more, checking any excessive terminal growth, so that one need not prune so severely the following spring. Where this checking is done in such a way as to remove only a small amount of wood in each case, or merely pinch back the buds, the tendency will be to force out a few laterals and also to form a few fruit buds lower down the shoot. Among pears it is very common to find the trees producing numbers of large fruit buds at the terminals, and if



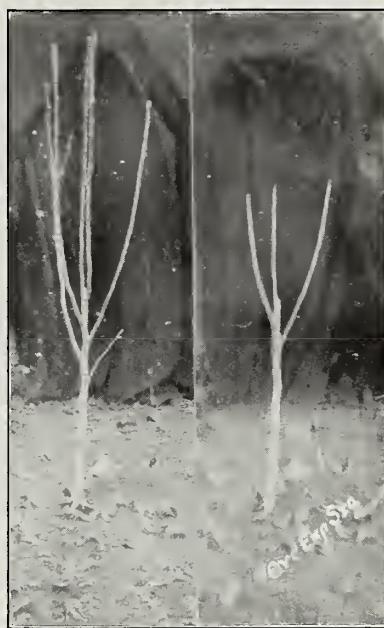
A younger vine than previous cut, unpruned



Same vine pruned



Three-year-old Bartlett before pruning



D'Anjou one year after planting, before and after pruning. As a rule all the branches should not be cut at the same height from the ground.



Three-year-old Bartlett after pruning

the trees are pruned in the spring it is done at the sacrifice of a large percentage of the crop. One should endeavor to grow an abundance of fruit spurs the entire length of the branch. Probably material heading in the spring, followed by a light checking such as is produced by moderate heading back about the first of July, will go a long way to produce these fruit buds lower on the branches than they commonly occur. This is a subject which our growers should look into more closely and should be willing to experiment with much more than they are doing at present.

The general belief is that cherries should not be pruned. It is hard to understand upon what such a theory is based. The lack of proper pruning of the young cherry trees will simply mean that the bulk of the fruit must be picked from ladders at least twenty feet in length, and it is hard to realize any profit under such conditions. The cherry naturally grows with little encouragement to the goblet or wine glass shape. Growth is very vigorous the first few years, and the tree is often fifteen feet in height before the main fruit spurs are formed. The fruit is clustered in heavy spurs near the base of the vigorous growth, and one often discovers wood bearing areas that should be developed into heavier fruit bearing. Care should be taken that the branches do not form at one point; decay sets in and excessive gumming is often found in such places. Try to get the branches well distributed and cut severely the first few years. One will often need to practice at least two prunings, one in spring and one in summer, the first few years in order to produce a spreading tree. By using a little care one can make a more spreading tree than we commonly see, and

one that will be both more fruitful and more easily handled. In cutting off large branches care should be exercised in protecting the wounds. Cut the branches as near the main branch or body as possible. Where trees have badly declined they can often be successfully rejuvenated by heading back quite severely, cutting below the dead and weak growth. I have seen trees pruned so severely that fifteen to twenty feet were removed from the top, and when given good care these trees came into good bearing in a few years. Many large neglected orchards can be rejuvenated in this way.

Buy one-year-old peach trees. Head them low; the lower the better. In the majority of cases I would advise one to prune off all the laterals at the time the trees are set, as often I have seen much die-back, and have at times experienced difficulty in getting well balanced trees. We prefer to leave some laterals, cutting them back to two or three buds. Great care should be observed in heading peach trees; do not do this until just before the growth starts. At the end of the first year's growth it will be advisable to allow only from four to five of the main branches to grow, but in the majority of cases these should be cut back to about one foot in length. Choose a right angle triangle, with the apex of the angle on the base of your tree, for your ideal. This pruning may seem severe, but it will give strong, thick, heavy branches and a good foundation for heavy bearing. At the end of the second year you will have need to practice a great deal of thinning out, as the heading back the first year will force out many lateral buds. The aim from now on is to develop strong shoots. Strong terminal shoots will need heading back. This will mean that most of your fruit will

be cut off. In fact one should not expect his trees to bear heavily until at least four or five years of age. At the end of this second year's growth the tree should not be more than four feet in height, but will have a broad spread, since we are encouraging this broad spread each year. By the end of the third year's growth the young trees should be nicely formed, and less severe pruning will be needed. They will need considerable heading back each year, but more bud wood is allowed to remain than formerly. You must not forget that the fruit of the peach is always borne on one-year-old wood, and each year it is necessary to get strong wood if one is to get large peaches. This will mean that each year you will cut away from one-third to three-fourths of the one-year-old wood in order to allow the trees to have plenty of air and light and room for development and keep them from killing out all the lower bearing branches. As the tree comes into heavy bearing it is good practice to head back at the end of the dormant season, but often it is best not to head in laterals or do much pruning until the tree has bloomed, or until one can determine the amount of fruit that is set, and then prune accordingly. With peach trees that have been neglected but still have smooth bark, plump buds, or lower shoots, the old tops can be severely cut back, and in a few years a new top can be developed. Summer pruning can be practiced to advantage. I would not practice shearing as is done so often, as it means the development of weak lateral growth, which becomes so dense that it kills out all bearing growth below, but moderate cutting back during the summer will have a tendency to encourage the formation of fruit buds and force out new laterals.

Here in Oregon the prune is generally grown for drying purposes rather than to be picked by hand. The Italian prune does not tend to become as high as most fruit trees. It is very desirable to have a heavy mulch at the base of the tree, since the fruit is allowed to drop before it is gathered for drying purposes, and the trees are pruned accordingly. Head all the way from twenty to thirty inches. One of the main points to remember about the prune is that we must have a fair amount of strong wood each year if we are to have large fruit, and large fruit is much more desirable than the smaller size. This means that we must practice annual pruning, for if you tend to skip a year you will fail to produce strong one-year-old wood, which will mean that sooner or later you will have small prunes. Thinning and pruning are combined as a rule in one practice. Give the branches plenty of air and light in which to develop.

Under grape pruning considerable confusion is often found, as authorities frequently do not discriminate between pruning and training. Pruning has to do with cutting back the vines to produce fruitfulness, etc., while training is applied to some method of tying or growing the vines. The renewal system is the one most commonly practiced with the American grapes. Under this system we only allow the bearing wood to remain a single year; after bearing once the canes are cut out and new bearing wood is grown. Remember not to allow too much bearing wood to grow at one season. While a vigorous vine might be able to carry four canes ten to twelve feet in length some others can carry only about two. In removing any of the canes it is better to remove the weak ones and allow the vine to retain only such fruit as it can grow to a high degree of perfection. In purchasing grape vines one needs to be sure that he has good plants and give them good ground preparation and food the first few



Four-year-old Jonathan, unpruned and pruned

years. If the vine becomes weak at the start it may never rally, and will never be a good producer. The vine is generally cut back to two or three buds at the time of planting. These shoots are allowed to grow the first year, and at the end of that time the stronger is chosen; and in pruning it is desirable to cut it back to two buds. The weak shoot is removed, the aim being to get a sturdy vine with a strong, heavy feeding root system. The main stub of all American varieties is tied to wires. Some allow a stub to grow only to the bottom wire, but most growers train the main stub to the top wire, four or five feet high. No fruiting should be allowed before the third year, and only light cropping at that time. In pruning the grape the fourth year remove all but two or three of the stronger canes, and each year in the future the practice will be to remove most of the bearing wood. There are many methods of training, such as the low horizontal arm, where only low wires are used, and high horizontal arm, where several wires are employed; the arms are trained to wires four or five feet from

the ground, as well as on lower wires. Some men have fruiting canes on one wire, and train new shoots and canes on the other wires. This means considerable work and may not pay unless one can secure high prices for the product. There are many methods of training other than those mentioned, such as fan, Kniffin, etc. The Kniffin is the droop system. A single stem or trunk is carried to the top wire and then about two canes are taken out from side spurs on each wire, two wires being used. Some growers cut these back severely, while others allow quite long arms on each wire. Generally the top canes are allowed to grow out somewhat longer than the lower canes, and the bearing shoots are generally allowed to hang at will. With the horizontal arm systems the canes are usually tied to wires with raffia, yarn or similar material. The Kniffin system is specially adapted to strong growing vines. There are a great many modifications of the system. The Vinifera or California grapes, as they are commonly called, as a rule are not grown on trellis, but on stumps. The aim is,



Six-year-old Newtown before pruning



Group of satisfactory pruning tools. Every one necessary.
Do not overlook the paint or wax can.



Six-year-old Newtown after pruning



Summer pruning the apple. Showing excessive pruning. Summer pruning should be generally light in character.

for the first few years, to grow a strong, self-supporting stump. In some cases it will be necessary to stake the stump for the first two or three years. There are a number of methods used, and grape growers must become expert pruners and study their varieties very carefully, adopting the system of pruning best adapted to varieties at hand. They will do this as they obtain more and more experience.

There are several methods of pruning, known as short pruning, long pruning and the combinations of these. One will have to modify these various systems in accordance to the variety requirement, the aim being simply to maintain only sufficient wood to bear the amount of fruit possible without exhaustion. The pruning in most cases consists in the cutting away of last year's wood to a large extent, although occasionally it is necessary to cut off

some of the older wood. In short, we be removed. One will constantly need to watch the vines, so as to keep up the vigor of the wood, to encourage canes to spread and yet keep the bearing wood as a rule fairly close to the main stump. Occasionally the long system of pruning is used, where long canes are tied to a stake or trellis. One will adapt the vine to the system to which it is most suited, according to its growth, and will always go on the principle to develop each year a sufficient amount of strong wood for that crop. The very short pruning is very rarely practiced in Oregon; the half length is more commonly used. first pick out the desirable canes that we wish to remain, paying attention to their vigor and strength and the amount they can consistently carry to advantage; all other canes are entirely removed. These remaining canes are

cut back to spurs containing two or three buds. This system is only adapted to those varieties that bear fruit heavily at the base of the canes. With those that do not have this habit the system known as the half long system is commonly used. From four to eight or nine eyes are left, according to variety. Generally more fruit is borne than by the short pruning system, for more shoots as a rule are allowed to remain, and there is a general tendency of a great many varieties to be more fruitful from the upper buds than from the lower. This tendency to bear better on the ends of the canes, if followed too closely, will often lead to disaster, as the vine will get too rangy and at times will cease to be highly productive. To remedy this we cut back a few of the canes to just two or three buds, so that new, strong canes can be grown near the stump, which will eventually take the place of the longer canes, which, in due time, will

To be continued in next edition.

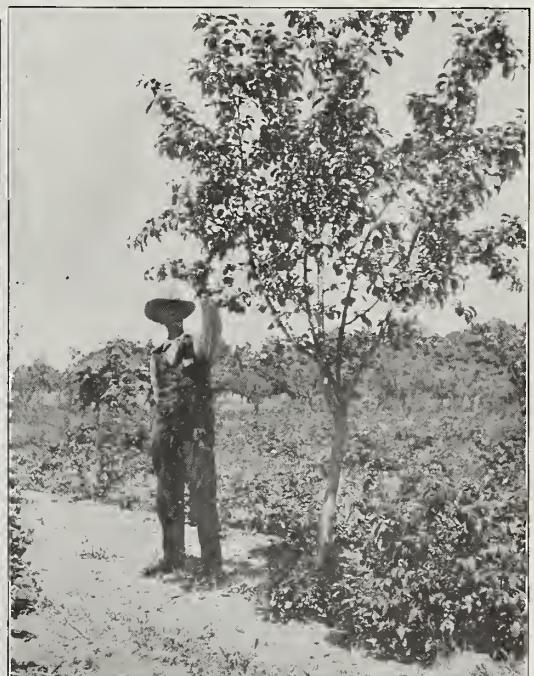
The highest types of apple in the world today are the Hood River Spitzenberg and Yellow Newtown Pippin; the highest type today to Hood River's cosmopolitan people of a life insurance policy is a Policy of the National Life Insurance Company of the United States of America, of Chicago.

These Policies, which hundreds of your neighbors have, make superb Christmas presents, Happy New Year gifts, appropriate wedding presents, choice birthday reminders and unexcelled anniversary tokens.

Write for information to the Agent at Large, Dr. James H. Shults, Hood River, whom most of you know, quote "Better Fruit," and full and satisfactory information will be furnished and hurry orders will receive prompt attention by telegraph and special delivery letters.



Examples of well cultivated peach orchard in the Brown County district, Indiana



Vigorous five-year-old in Elkhart County, Indiana

Systematic Cultivation of the Peach Orchard A Necessity

By Benjamin W. Douglass

THE men who are going into the business of peach growing in the East, or any other section, realize that systematic cultivation is just as necessary for success as the work of planting the tree itself. The time has passed when trees can be planted and allowed to care for themselves; and there are logical reasons why it has passed. At one time it was possible to grow perfect peaches with absolutely no attention from the time the tree was planted till the crop was gathered. We all know this to be true because most of us have seen it occur. Why, then, is it necessary to fuss with spraying, pruning and cultivation in this generation? The answer lies in the fact that almost all of the conditions surrounding the growth of trees have changed in the past decade. I do not say that there was a time when cultivation would not have improved the quality of both tree and fruit, but there never was a time when it was so seriously needed as at the present. Former soil conditions were such that trees could not help growing even under conditions of neglect. Cultivation today must make up for what our soils have lost in the way of fertility, and it must also act to conserve our less abundant supply of soil moisture. The destruction of forests has undoubtedly operated to render our rainfall not only less in quantity but it has also tended to cause the rainfall to be greater during certain seasons of the year, i. e., the rain is no longer so uniformly distributed throughout the year as it formerly was. This defect must be remedied by intelligent cultivation.

Our orchard soils that have been depleted through years of over cropping must be returned to a fair state of fertility if we are to expect the best results. By this I refer not only to the soils that are actually in orchard at the present time but quite as much to

the great acreage adapted to orcharding, which is at present being devoted to less productive lines of husbandry. In a depleted soil we must recognize one of two conditions. Either the natural elements of the soil have become completely exhausted or the portion of them that is available for plant use has become exhausted. The first condition can usually be remedied only by actually returning to the soil that which has been taken away, but in the latter case simple cultivation will do much to improve the quality of the soil.

At least two common and important elements of any soil can be returned to a greater or less extent by systematic cultivation. These are potash and nitrogen. Potash exists in most of our soils as a broken down granite rock. The New England hills have enough potash stored in their rocky slopes to provide fertility for the entire country for generations, but no one has found a method of laying hold of it cheaply enough that it is of any commercial importance. For thousands of years nature has been unlocking the potash in the granite storehouses, and the supply for the great Central States area was brought to us from the far north in glacial times. Some of it was in a condition available for plant food immediately after the glaciers had receded, but much of it still remains locked up in tiny particles in our soils today. Each year the action of the frost and the sun brings more of this important chemical into such a condition that plants can use it, and cultivation is simply one way of aiding nature in this liberating process. Nitrogen, on the other hand, is one of the most evanescent of our soil elements. It ordinarily exists in the form of a gas and is a common constituent of the air. It may also be returned to the soil, though in a more indirect way than we secure the available potash. Certain plants (the clovers and their allies)

possess the property of taking the nitrogen of the air and fix it in such form in the soil that it becomes available for the use of other growing plants. Consequently by growing a crop of some clover or beans we can add the chemical nitrogen to our soil in almost any quantity we desire. Either of these chemicals can, of course, be added in the form of commercial fertilizer or the nitrogen can be supplied by the use of good barnyard manure, but as cultivation will assist in other respects its value as a factor in improving the chemical condition of the soil should not be overlooked.

The conservation of moisture by cultivation is one of the most important aspects of the entire orchard problem today. The West realized this years ago, and in the Pacific fruit districts cultivation is universally practiced. In the East we need cultivation to conserve our moisture today more than we ever needed it because, as I have stated, our rainfall is no longer evenly distributed throughout the year—at least it is not every year, and we will do well to prepare for droughts. During the past few seasons there have been parts of the East where the rainy season was almost as sharply delineated as it is in the West. There is plenty of moisture in the soil in the spring, but by midsummer the baked earth is parched and dry for a depth of several feet. By cultivation much of this soil moisture can be retained through the hot weather and made available for the use of the plants when they need it most. When the soil is not cultivated the surface bakes to a hard, smooth cover and the particles of moisture readily ascend to the top by capillary action. When they reach the top they quickly evaporate. The soil particles in such a case are packed so closely together that the thin film of water with which they are surrounded easily



An Indiana peach orchard



B. F. Mason's tickler at work (Indiana)



An orchard that failed (Indiana)



Small fruit plants between trees, Elkhart County, Indiana

makes its way from one particle to the other until it reaches the parched surface soil. On the other hand, if the top soil is kept constantly stirred we form a cushion of non-conducting material that prevents the soil moisture from reaching the surface—keeps it in the soil protected from the drying winds, where only the roots of the trees can reach it. This cushion on the surface is sometimes referred to as a dust mulch, as it serves the same purpose as a mulch—does it better—and does other things besides.

One of the most important things accomplished by the dust mulch system of cultivation is the destruction of insects that seek shelter in the sod of ordinary orchards. One of the most serious pests of the peach orchard is the plum curculio, a small beetle that passes the winter sheltered in the grass and rubbish in the sod under the trees. By cultivation of the orchard thousands of these pests will be killed before winter, as they spend much of the time during the summer in the places where they will spend the winter. Cultivation also takes care of much of the fallen fruit, turning it

under to decay instead of leaving it out on the surface to become a source of infection for the growing crop. In every well managed orchard some system of cultivation must be decided upon, and if possible a plan should be formulated for the cultivation of the orchard during a series of years. The sort of cover crop that is used should vary from year to year rather than remain the same one season after another. The young peach orchard should be cultivated the year it is planted and every year after that. For the first year it is practical to grow some extensive field crop such as corn between the rows. But after the first season the low growing inter crops are best. I prefer that the crops be low growing from the start, but some planters claim that the corn furnishes shade during the first season and prevents any chance of sun scald on the tender trunks. At the young orchard of L. V. Hopkins at Maxwell, Indiana, I had an opportunity to see the value of cultivation on young trees. Three years ago Mr. Hopkins planted an orchard of mixed varieties, and the entire place has been well cared for

during that time. One small corner was left with no cultivation simply to demonstrate the difference in growth. This corner today looks like anything but a peach orchard. The few trees that are still alive are small dwarfed specimens, while the cultivated trees of the same age, same variety and in the same soil are large thrifty trees. The cultivated portion of the orchard bore considerable fruit this season, some trees holding up as much as half a bushel of excellent peaches. At the orchard of B. F. Mason I saw a more striking example of the value of cultivation in the young orchard. Mr. Mason planted an orchard four years ago and purposely neglected one end of it. The main part of the orchard was inter planted with small fruit plants—strawberries and raspberries. These plants were given thorough cultivation, and as a result the trees have made a most remarkable growth. Many of the neglected trees have died, none of them are bearing fruit and all of them look far from thrifty. In this orchard no winter cover crop has been used, the small fruit plants serving to protect the soil to some extent, and



Uncultivated block of peach trees, B. F. Mason's (Indiana)



Cultivated block of same age, at B. F. Mason's (Indiana)

there has been no washing, even though the orchard is located on a decided slope. In Mr. Mason's older orchards he practices clean cultivation with no attempt to grow any crop for profit between trees. His system is to plough the orchard in the early spring, the date depending somewhat on the season. After the ground is broken it is gone over with a spring tooth harrow. This latter tool is then employed during the summer to maintain the "dust mulch" and to conserve the moisture. About the middle of August the cultivation is stopped and the ground seeded to cow peas or other legume. These plants remain on the ground as a protective cover crop during the winter and they are turned under the next spring when the soil is ploughed. In case the summer has been a very dry one the cultivation is carried further into the fall, and if the chances of securing a good stand of cow peas are not good a crop of rye is planted. This serves the same purpose as the pea crop in the winter, but it does not add any nitrogen to the soil.

The system employed by Mr. Mason is a simple one and one that is suitable to almost any Eastern orchard in full bearing. It accomplishes the object of cultivation, the conservation of the soil moisture, the improvement of the chemical condition of the soil and the destruction of certain injurious insects. That such a system is profitable one could never doubt after seeing the orchards when the fruit is being



Uncultivated peach orchard, L. V. Hopkins' place, Maxwell, Indiana

gathered, especially if an opportunity is afforded to compare this fruit with that from a neglected tree. Cultivation has been an important factor in the success of Western orchards and we cannot expect equality with the West until we bring ourselves to realize that Western methods are applicable and essentially right here at home. We will then grow fruit that is surpassed by none and we will not be constantly facing mountains of difficulty in the way of distant markets and inadequate transportation.

ing to quality and condition. Large quantities of apples arriving from Nova Scotia are selling at similar prices. Light supplies from the Ontario Province of Canada bring a higher price, especially for choice varieties, prices generally ruling from \$3.65 to \$4.86, a few fancy Kings reaching \$5.83 to \$6.32 on November 27. California New-towns, received in moderate quantities, are selling, four-tier fruit, at \$1.82 to \$2.12; four and one-half tiers at \$1.58 to \$1.88, only the finest stock securing the higher prices. A few Oregon New-towns have been received and have sold at \$3.40 to \$3.65 per box of 128 to 150, the former number being the favorite pack. The prospects for Washington apples this year for extra fancy grades is promising on account of the reported short supply, but for ordinary red fruit the outlook is stated by the trade to be less encouraging.

The method of selling apples on the Liverpool market is by public auction, regulated by custom and not by rule. Of the total importations fully eighty per cent are thus sold. The practice is well established and meets with general local approval, the prevailing opinion being that the best practical business results are obtained when the fruit is offered publicly and sold after inspection. Apple brokers sell by auction, but there is no rule of any association requiring them to do so. Merchants sell both by auction and by private treaty, according to circumstances. There are no association restrictions as to sale by private treaty. Liverpool imported 561,169 hundredweight (112 pounds to hundredweight) of apples in 1910, worth \$3,561,639. A list of fruit and vegetable commission houses in Liverpool is forwarded (and may be had from the Bureau of Manufactures).

Apple Trade in England

Consul Horace L. Washington, Liverpool, in Daily Consular and Trade Reports

LIVERPOOL is the leading English port for the importation of American and Canadian apples. These include those grown in the State of Washington, large imports of which have met with great favor, especially for the better varieties, such as Newtown Pippins,

Spitzenbergs, Rome Beauties, Winesaps and other similar grades. However, this district takes the Newtown Pippin in preference to any other variety, as in ordinary seasons large quantities of red fruit grown east of the Mississippi are received; this, with the lower rate of freight, is stated by the trade to affect the sale of the Pacific Coast fruit, more particularly of the lower qualities, such as Ben Davis. No apples have been received in this market from the Wenatchee, Yakima and Cashmere Valley districts so far this year.

At present the Liverpool market is supplied with barrelled stock, particularly from the New England states, selling at \$2.92 to \$3.85 per barrel, accord-



Cultivated peach orchard, Harrison County, Indiana



Cultivated peach orchard at L. V. Hopkins' place, Maxwell, Indiana

Effects of Sub-Soiling With Dynamite

COMMERCIAL fertilizers are ordinarily added to the soil in a very fine and readily soluble condition, and are usually incorporated with the first few inches of soil at or just before the time of seeding. This keeps them from being carried further into the soil mass through cultivation. During heavy rains, when there is a considerable amount of surface run-off of the excess of water, large parts of the fertilizers thus added are at once brought into solution and lost by being carried away by the surface drainage. The fertilizing elements can, however, be carried into the deeper soils by trans-fusion through the soil moisture or they can be carried down with percolating water, provided the sub-soil has been made sufficiently porous to permit of such percolation. Where soils are at all packed both of these processes are materially hindered, but can be relieved by a thorough breaking to a sufficient depth. Except in very rare instances, these troubles occur beyond the reach of the plow and the use of dynamite becomes necessary.

This movement of readily available fertilizers will result in an enormous decrease in the loss of fertilizers by drainage and also in inducing a deeper development of roots, in search of food, the importance of which is already so thoroughly understood by those now interested in promotion of deep sub-soiling. The use of a large amount of fertilizers is largely handicapped by even a short season of drought. During the spring, when the soils contain large amounts of moisture, heavy applications of fertilizers result at once in a very luxuriant growth of very succulent vegetation. A plant thus developed is poorly able

to combat dry soil conditions. Deep sub-soiling brought in connection with such heavy applications of fertilizers naturally brings about a much better soil moisture condition. This, of course, permits of the very vigorous and rapid growth during the spring. It also safeguards the plants against the dry summer by affording the additional reservoir for water. For the proper development of a plant certain foods and conditions are necessary. If one of the foods is lacking or deficient in amount the growth of the plant will correspond with the amount of this food available and will not be influenced beyond this extent by excesses of the other foods present. Water is, of course, one of the essential foods, so when additional foods are added in the form of chemical fertilizers it becomes necessary to furnish the plant with an increased supply of water in order that no check is placed on the growth of the plants.—Contributed.

Annual Convention

If the thirty-seventh annual convention of the American Association of Nurserymen is not a splendid success it will not be the fault of the New England members of the craft. A joint meeting of the various committees was held in Boston, March 12, and was attended by Secretary John Hall, Vice-President W. H. Wyman and Harlan P. Kelsey of the committee on arrangements; J. Woodward Manning, committee on entertainment, and A. E. Robinson, committee on exhibits. A change in convention headquarters was found necessary and Hotel Somerset was unanimously chosen. This hostelry is located on Commonwealth Avenue, is

of fireproof construction, thoroughly up to date, and affords ample facilities for the association meetings and for exhibits. Chairman Manning of the entertainment committee is absolutely embarrassed by the liberality of his local brethren, who are displaying that spirit of genuine hospitality so characteristic of New England in their determination to make the occasion memorable.

The dates of the convention is June 12-14. The business sessions will be confined to mornings and will be occupied with the discussion of topics of vital interest to the trade. The secretary is preparing the annual circular of particulars, which he expects to mail very soon. In the meantime he urges upon patrons of the badge book the wisdom of preparing their copy now so as to facilitate an early issue of that publication. Exhibits promise to be more numerous than ever, and those interested should lose no time in communicating with Mr. A. E. Robinson, Lexington, Massachusetts. The various railroad passenger associations have announced that summer tourist tickets will be on sale beginning June 1, on a basis, approximately, of one and one-half first class fares for the round trip, and the wish is expressed that many of the Western members might make this an occasion for summer vacation for themselves and families. Requests for further information regarding either the convention arrangements or as to membership may be addressed to John Hall, secretary, 204 Granite Building, Rochester, New York.

Fruit Statistics

Comparative statistics compiled by R. G. Dun & Co. on the fruit crops of the past two years show that during the year 1910 the State of Oregon produced 2,650,000 boxes of apples of a value of two and a half million dollars, while for 1911 the crop totaled 1,100,000 boxes, for which was received \$1,094,000. The past year, an off year, was proportionately small because of the extra large crop of 1910. The total valuation of all fruits for the respective two years was \$6,655,500 and \$5,612,000. The figures of 1910 were submitted by W. K. Newell, president of the State Horticultural Society. The figures for 1911, which appear below, while unofficial, are considered as substantially correct:

Variety	Amount	Value
Apples, boxes	1,100,040	\$1,094,000
Pears	97,000	147,000
Peaches	580,000	290,000
Cherries	4,000,000	240,000
Plums and fresh prunes, crates	200,000	120,000
Dried prunes, pounds..	21,000,000	2,510,000
Apricots, boxes.....	15,000	10,000
Grapes, pounds.....	4,500,000	125,000
Strawberries, pounds..	9,450,000	500,000
Blackberries and Rasp- berries	4,000,000	200,000
Loganberries	5,000,000	250,000
Currants	360,000	26,000
Gooseberries	500,000	24,000
Other fruits .....	.....	36,000
Nuts	275,000	40,000
Total		\$5,612,000

Influence of Environmental Conditions Upon Plant Diseases

By George M. Reed, Botanist, University of Missouri

THE fact that serious epidemics of plant diseases are associated with definite weather conditions has been repeatedly noted. The agriculturist has often observed that the blighting of potatoes, the rotting of grapes or the rusting of wheat has had a close relation to the amount of moisture during a given period. It is not surprising, therefore, that the amount of rainfall and abnormal variations in temperature have been considered the direct cause of serious losses to cultivated crops by those who have had no intimate knowledge of the real nature of the common plant diseases. While many still believe that weather conditions are the cause of damage to growing crops, most people have come to recognize the weather, not as the direct cause, but rather as a set of conditions which may favor or hinder the development of a living organism which is the real agent in causing the injury. It has been well established that those losses which occur in epidemic form are due to the growth and development of a living organism. For the most part plant diseases result from the growth of a fungus or a bacterium which lives as a parasite in the tissues of the higher plant. Such diseases are infectious, for the parasite spreads rapidly from one host to another under favorable conditions. The weather is important, therefore, as a set of complex conditions which influence the progress of the causal organism.

Plants, of course, may suffer directly on account of unfavorable environmental conditions, as lack of moisture or low temperatures. These injuries, however, are quite different from the frequent severe outbreaks of disease due to living organisms. Fungi and bacteria are the principal causal organisms of plant disease. Like all other plants they are influenced by the various factors which make up their environment. Light, water supply and temperature play a very important part in their development. Such environmental conditions as these may influence plant diseases in two distinct ways. They may act directly on the host plant, and thus make it less able to resist invasion by the fungus. On the other hand, the effect may be upon the parasite; additional moisture, for example, may aid in the germination of the spores. The same set of conditions may, of course, act in both ways at the same time. A particular condition may be unfavorable for the best development of the host and at the same time greatly increase the chances of the fungus for invasion. The interrelationship of host and parasite is very complex, and in consequence environmental conditions exert a very great influence in the progress of disease.

Many fungi, such as the rusts, powdery mildews, etc., are able to invade the normal healthy tissues of their host. They are strict parasites, and are

able to attain their full development only on living plants. Other fungi, as the brown rot of stone fruits, are able to live readily on dead organic matter; under suitable conditions, however, they may invade the tissues of living plants and develop at the expense of their cells. They are thus hemi-parasites, or facultative parasites. The strict parasites will be aided to a very great extent by the direct effect of environment. Any condition which assists in the dissemination of the spores, their germination and subsequent penetration of the host tissues will have a marked influence in the development and progress of disease. While the hemi-parasites will also be aided in this direct way any condition that tends to injure or weaken the host or break down its resistance increases the chances for fungus invasion. Some experimental work has been done toward determining the influence of various factors of the environment in the spread of certain diseases. For the most part, however, the facts known are the result of causal observations made in connection with other experimental work. It is further true that little has been done toward isolating the different factors and determining the effect of each. A particular epidemic may be due to increased water supply, or to peculiar temperature conditions, or to these combined. Sometimes we may be able to pick out the more important condition, but more often it is a combination of factors which brings about the conditions favorable for an epidemic of some serious disease.

Influence of Soil Conditions.—The reaction of the soil has been shown to be a factor of considerable importance in certain fungus diseases of plants. Many fungi are markedly influenced by the acidity or alkalinity of the substratum. Briggs, in Connecticut, has found that the root-rot of tobacco is much more serious in an alkaline soil. For the best results in growing tobacco the soil must be enriched by the addition of fertilizers. Where lime and alkaline fertilizers are used there is a marked occurrence of the disease. The fungus attacks the tobacco roots very severely in soils which are made alkaline by the use of large quantities of lime, ashes or fertilizers containing carbonate of potash. Briggs has found that the use of acid fertilizers has been effective in controlling the disease. In this way the soil is sufficiently enriched for the tobacco plants and at the same time favorable conditions for the fungus are avoided. It has long been known that the club-root of cabbage and related plants is influenced by soil conditions. The causal organism enters the young roots of the host. After penetration it develops within the root tissues and gives use to the characteristic malformations. It was early observed that on Long Island, when cabbage fields were enriched with the

shells of mussels, etc., the disease was not destructive. This observation led to experiments by Halstead and others to determine the value of adding lime to the soil. It was found that liming the soil was very effective in controlling this disease. The trouble has always proved more severe in acid soils, and consequently losses may be prevented by making the soil alkaline by the use of sufficient quantities of lime. That aeration of the soil is of importance is shown in connection with the root-rot of cotton. The fungus lives in the soil, and under favorable conditions attacks the roots of the cotton plants. It destroys the rootlets and then spreads into the vascular tissues, causing the plants to wilt. Experiments show that lack of proper aeration of the soil is one of the most important factors favoring the disease. The organism grows best where the aeration of the soil is poorest. A remedy has been found in the improvement of the soil aeration by deeper plowing, and also by fall plowing.

The Influence of Water Supply.—It has long been recognized that the amount of rainfall has had a marked influence on the spread of fungous diseases. Quite generally associated with rainfall are marked changes in temperature. While it is often practically impossible to distinguish between these two factors, yet, in certain cases at least, the water factor is the most important. Water supply may have a direct effect on the parasite, aiding in the germination of the spores. On the other hand, the main effect may be produced on the host causing a more rapid growth, an increase in the size of the cells and the development of more succulent tissues. In either case a disease may become much more severe in its effects. The most serious disease of the asparagus is the rust. As a result of a number of observations and experiments the relation of water supply to epidemics of this disease has been traced out. In Massachusetts Stone and Smith found that there was a great variation in the prevalence of rust, depending upon whether the beds were located in soil that retained large quantities of water. They found that the asparagus suffered much more severely upon the drier soils. In some localities, where the chances for infection were equal, the beds upon the heavier, most moist soils showed practically no rust, and then not until late in the season, while the beds located upon light, dry soils became badly infected very early in the season. The seasons of 1895 and 1896 were unusually dry and the rust was found prevalent on nearly all the beds. On the other hand, the season of 1897 was one of excessive rainfall, and during this year many beds which ordinarily rusted badly showed very little rust, and then only late in the season. The facts are explained on the view that the vitality of the asparagus plants is

much reduced in dry seasons and upon the drier soils, and in consequence the fungus is able to invade the host more successfully. When sufficient water is present the host is able to grow more vigorously, and thus be better able to withstand the invasions of the parasite. Sirrine, in New York, contributed some new observations on this disease. He found that excessive dewfall was specially favorable to the progress of the disease. The amount of dewfall was, furthermore, more important than rain. In California, where irrigation is resorted to, Smith was able to test the question experimentally. He found that if asparagus beds were left without irrigation and cultivation in the summer they became extremely dry. In such beds the rust spread rapidly and the plants suffered severely, the tops dying down to the ground. On the irrigated and cultivated beds the plants were green and vigorous, and also free from rust. The driest beds rust first and most severely. Smith concluded that there was both a direct and indirect relation of water to the spread of asparagus rust. The indirect relation is the effect of moisture on the parasite through its effect upon the host, and is limited to the soil water. With plenty of water the host develops vigorously and is able to resist invasions by the rust. This is shown by varying amounts of rainfall in different seasons, by differences in the water containing capacity of different soils and the effects of irrigation. Except under unusual conditions this indirect relation is the most important. The direct relation is the effect of moisture acting upon the spores and mycelium of the fungus. Dew is necessary for spore germination and subsequent infection by the parasite, and is of more importance than rain. Atmospheric dryness also checks the formation of aecidiospores and uredospores, while moisture aids spore formation.

The carnation rust was introduced into this country from Europe and was first reported about 1890, and immediately became a serious menace to the growing of carnations. Some growers seemed especially to suffer from the disease, while the plants of others were relatively free. Although differences in susceptibility of varieties were observed, yet it was found that two growers might use cuttings from the same plants and one have abundant rust and at the same time the plants of the other grower might remain relatively free from the disease. Although all the conditions which favor or retard the spread of the disease are not fully known, it has been found that the method of watering is of prime importance. The rust spores require water for germination, consequently if the leaves of the carnation in the process of watering the plants become wet the fungous spores find favorable conditions for germination and subsequent penetration. On the other hand, sub-irrigation has proven an efficient method for keeping down the rust. It is important, furthermore, that the

leaves should not come into contact with the wet soil and a good free circulation of air among the plants should be provided.

The rusts of our common cereals have proved disastrous in practically all parts of the world. Observers everywhere have noted the fact that the damage is much greater some years than others. "Rust years" are spoken of and epidemics of the disease are associated with certain fairly definite weather conditions. The relation between humid atmospheric conditions and epidemics of rust have been repeatedly observed. Rust infection is specially favored by humid, showery, sultry days, followed by foggy, cool, dewy nights. Great damage will occur if these weather conditions appear at the blossom period. In those districts where irrigation is resorted to and where there is an absence of dew or rain to wet the foliage, rust never causes serious injuries to the cereals. The formation of dew is most favorable to rust infection. Its presence on the leaves enables the rust spores to germinate and obtain entrance into the interior of the host. Heavy rains may tend to prevent infection by washing the spores from the plants. Moist weather conditions also favor a rank growth of the plants, making them more succulent and susceptible to rust invasion. On account of the moist atmospheric conditions wheat suffers much more severely from rust in the coast counties of California than in the interior portions of the state. The best wheat regions of the state are located in the interior valleys, where the water relations are much less favorable to the rust fungus.

Black rot of the grape has proved to be one of the most serious maladies to the grape grower. It is prevalent in all of the grape districts of the United States. The disease is of American origin and was introduced into France about 1883. Very shortly after its introduction it spread throughout the vineyards and threatened very great damage to the vines. Viala early noted the relation between the serious outbreaks of the disease and moist weather conditions. While the disease is present in the vineyards at all times it requires a period of wet weather, accompanied by a high temperature, to bring about an epidemic. After an outbreak has occurred its progress is quickly checked on the return of a period of dry weather. The disease is also always more serious in humid valleys. This relation between moisture and an epidemic has been observed repeatedly.

The outbreaks of the fungus which causes the brown rot of stone fruits have long been associated with moist weather conditions. While this fungus is always present in fruit orchards it becomes destructive only during excessively moist weather. Quaintance has made a special study of the influence of wet weather on brown rot in Georgia. He compared the two years 1898 and 1900. The former was a good

peach year and an unusually large crop of fruit was marketed. In 1900, at the first of June, there was every promise of a fine crop, but fully forty per cent of the peaches were ruined during the season by the disease. Rain fell in different parts of the state on 20-25 days of the month. Practically all the days were cloudy and the atmosphere humid. Some of the rains were heavy, while others were light. The air was thus kept humid and the fruit more or less moist. It has come to be recognized that in Georgia a wet June means a serious rotting of peaches.

Black rot, an important disease of the cabbage, is caused by a bacterium. In some sections, notably Wisconsin, it has proved very destructive. The disease makes its first appearance on the edges of the leaves. It begins at the blunt teeth on the margin of the leaf, and from there spreads backward through the veins. An examination of the structure of the cabbage leaf shows that the water pores of the plant are located on these teeth. These pores are permanent openings in the plant, and through them the excess water in transpiration escapes. Usually the water passes off in the form of vapor, but if the air is very humid the water collects in tiny droplets at the mouths of these pores. Due to the atmospheric conditions, these droplets of exuded water are especially frequent in the morning, and it is quite common at that time to observe a number of droplets clinging to the margin of the leaves. The bacteria which cause the malady are extremely minute and easily widely distributed over the cabbage field. Some of them will find lodgment in these droplets of water and, as the organisms are motile, they will make their way into the interior of the leaf. When the atmospheric conditions are favorable the disease spreads very rapidly. That this is the correct interpretation of the symptoms of the disease manifested in the field is clearly shown by laboratory inoculations. If a few bacteria are placed in these droplets of water the characteristic symptoms of the disease quickly appear. The fact that the disease makes more rapid progress in wet than in dry seasons is thus clearly explained.

The late blight of the potato is one of the most serious diseases with which the potato grower has to contend. It has proved specially injurious in various parts of Europe and in the potato districts of New England and New York in this country. In the United States the disease appears in epidemic form during the latter part of July, and is most prevalent during August and early September. A few days of warm, rainy weather suffices to give the fungus a start and to bring about the production of conidia on the leaves. These conidia are distributed widely, and moist weather conditions greatly favor their germination and the subsequent penetration of healthy potato leaves. Entire fields of potatoes may be devastated within a few days of moist, rainy weather. The vines

quickly turn black and die. While warm weather undoubtedly favors the development of the disease, it has been shown that the high temperature of summer will quickly check its spread. The determining condition is a period of rainy, cloudy or foggy weather.

Influence of Temperature.—Temperature is a factor of very great importance in the spread of some fungous maladies. This is especially true when definite temperature and moisture conditions combine. The fungus which causes bitter rot of apples is a characteristic hot weather organism. It is a serious menace to apple growing in the southern portions of the apple belt—West Virginia, Southern Illinois and Missouri. It attains its full development during the latter part of July, August and early September—the hot weather period of the season. A few bright, hot days, with a temperature approaching ninety degrees, will be sufficient to start an outbreak. The fruit on the south or sunny side of the tree may be badly affected before the disease is noticeable on the north shady side. The fruit on the inner lower branches, well protected from the sun's rays, often escapes when that on the exposed portions of the same tree is destroyed. There is also a greater percentage of rot on trees partially defoliated by leaf-spot fungi. Even on individual apples the rotten areas develop most rapidly on the part exposed to the sun. A period of cool weather is sufficient to check an outbreak of the disease, especially if the mean temperature remains below seventy degrees. Even when conditions are favorable for the disease at the time of picking the apples the crop can be saved by keeping the fruit at a cool temperature. Pierce has made a special study of the disease of the peach. In many parts of the United States the malady is often quite serious on account of the defoliation of the trees. As a result of the observations of a number of people it is the accepted view that curl is much more prevalent after a cold spell in the spring. The disease is rarely serious in a uniformly dry, warm season. In cases where the infection has occurred, the development of the fungus within the tissues of the host may be checked by the return of warm, dry weather. It has been pointed out that the noted leaf curl years in New York and Ohio (1893-1898) were preceded by cold and humid conditions during April when the buds of the peach normally start their development. Erickson has tested the effect of low temperatures upon the capacity for germination of various rust spores. In his work he placed aecidiospores from the barberry and uredospores from various grasses in ice water, and even subjected them to temperatures considerably below the freezing point of water. He found a marked increase in the percentage of germination of the spores treated in this way. In some cases spores placed in water at ordinary temperatures showed practically no germination,

while similar spores subjected to cooling for a few hours and then placed at ordinary temperatures gave a high percentage of germination.

Light Relation and the Nutrition of the Host.—It is by means of the energy of sunlight that the green plants are able to carry on the important process of photosynthesis. Through the agency of the light the plant is able to combine simple substances as carbon dioxide and water into complex organic substances as carbohydrates. The carbohydrates usually formed are starch and sugar. If the light is removed the plant is no longer able to carry on this important work. In addition to its importance in connection with photosynthesis the amount of illumination has a marked influence on vegetation. Plants grown in partial shade differ greatly in their structure from those which are grown in direct sunlight. Their leaves are usually broader, the cells are proportionately larger and the various tissues contain more water. Plants grown in extreme shade, or in the absence of any light, manifest etiolation. They are devoid of their normal green color; the stems are longer, more slender, flaccid and weak as compared with plants grown in the light. The fact that light is of fundamental importance to the healthy development of green plants would indicate that, indirectly at least, it may play a part in the progress of fungous diseases. It is doubtful whether light has any direct effect upon the parasite, but there can be no question but that it is of marked indirect importance in many cases. There are a few cases on record where a disease may be favored by intense illumination. Celery, for example, is damaged seriously by the early blight fungus when grown in strong sunlight. The disease seems to develop best during bright, hot days, especially when dews occur at night. The trouble is controlled, in part at least, by partial shade. Most fungous diseases, however, develop best under shade conditions. This is notably true of the powdery mildews. These parasites always seem to thrive best on hosts which are growing in situations where the direct sunlight is excluded all, or at least part, of the day. It is a matter of common observation to find the grass mildew on various hosts growing in the shade of trees. The same is true for the powdery mildews on the strawberry, and also on cucumbers. As the loss of water is much less in shaded places, it is quite probable that the important factor in these cases is the water relation. Brooks, for example, has shown that *Botrytis* is able to develop on leaves of lettuce plants which have been kept in the dark until they show signs of yellowing. The normal green leaves, however, are not invaded. In contrast to these results obligate parasites will not invade such abnormal tissues of their host. Ward found that if brome grasses are grown in the absence of light and thus become etiolated the rust (*Puccinia dispersa*

Eriks. and Henn.) is no longer able to penetrate and produce infection. It is, however, quite easy to infect healthy green plants of the bromes with the uredospores of the fungus.

It is commonly considered that vigor of growth and immunity to disease are equivalent terms. It is thought that a plant that is growing under the most favorable conditions will be less liable to disease. This, however, is only partly true. Sometimes the plant that we consider to be in the best possible growing condition is the one that is invaded, while a plant that is underdeveloped, more or less unhealthy, is likely to escape invasion by the parasite. However, a weakening of the host in any way may increase the chances of invasion by fungi which are hemi-parasitic in nature. The relation of plant diseases to the various factors of environment offers an interesting field for experimentation. It is well established that serious epidemics are connected with temperature changes, rainfall, etc. In addition to yielding facts of scientific interest a study of these relations will doubtless make possible more successful measures for preventing the damage done annually by parasitic fungi.



A. C. RULOFSON

Mr. Rulofson is a member of the firm of A. C. Rulofson & Co., Monadnock building, San Francisco, agents for Pearson's cement coated nails. For several years he has made it a point to attend every important apple show throughout the Northwest and consequently has an extended acquaintance with the fruit growers all over the Pacific Coast. While it is true that he has visited all of these apple shows for the purpose of making exhibits of Pearson's cement coated nails and telling about their good qualities, it is also true that in doing this he has not only become well known but very popular among the fruit growers. His interest in the apple shows and in the apple industry and his generosity has been shown by the splendid trophies that he has given for premiums. It is a pleasure to know Mr. Rulofson, and it is not only a pleasure but it is good business for the fruit grower to use Pearson's cement coated nails, which he sells, because he gives satisfaction.*

A Profitable Year for the Eugene Fruit Growers

From Eugene (Oregon) Register

STARTING four years ago with practically nothing, the Eugene Fruit Growers' Association has built up a business that handles nearly a quarter of a million dollars annually, and this year paid a dividend of six per cent to stockholders. Annual meeting of the stockholders was called to order January 13 by President H. F. McCornack, with 1,789 shares of stock represented. First in order of business was the election of directors, which resulted as follows: Dr. H. F. McCornack, F. B. Chase, F. E. Bristow, J. Beebe (county fruit inspector), J. D. Spencer, John Thramer, Mahlon Harlow, Ernest Miller and George A. Dorris.

Manager J. O. Holt read his annual report to the stockholders, salient points from which follow: Cherries received, Royal Ann, 453,619 pounds, netting grower four cents; Soft White, 32,764 pounds, netting grower three and one-half cents; Black Republican, 17,174 pounds, netting grower three cents; Sour Red, 3,122 pounds, netting grower four cents; Bing and Lambert, 670 pounds, netting grower five cents; 253 tons, or 507,349 pounds; total value, \$19,975.10. Peaches received, 608 boxes, averaging 97½ cents. Pears received, first grade, 41,687 pounds, netting growers \$27.50 a ton; second grade, 115,721 pounds, netting growers \$20 a ton. Green prunes received, 766,836 pounds; green prunes canned, 72,000 pounds; prunes dried, 694,836 pounds; weight after drying, 189,064; received from other driers, 470,317 pounds; total dried prunes handled, 659,381 pounds; total receipts for prunes, \$33,500.01; Petits, green prunes received, 51,295 pounds; dried to 15,719 pounds; dried prunes received from other driers, 11,406 pounds; total handled, 27,425 pounds, valued at \$1,003.88; Willamette prunes handled, 15,297 pounds, valued at \$951.53; total amount of all prunes handled, 701,799 pounds, or 350 tons, valued at \$35,455.42. Strawberries received, 1,845 crates, which sold from \$1.23 to \$1.75, averaging eight cents a crate higher than last year. Loganberries proved a disappointment, only 29,363 pounds being handled by the association as against 46,000 pounds last year. The berries netted the growers three and one-half cents a pound. Raspberries received, 13,380 pounds at five cents. Of blackberries there were canned 4,876 pounds.

Produce.—String beans, eight tons, the growers being paid \$50 a ton. Sixty-one tons pumpkins, canned, the growers receiving \$5 a ton. Twelve tons of Hubbard squash, canned, the growers receiving \$6 a ton.

Canned Goods.—During the year the association packed 7,135 cases of canned goods at a cost of \$10,688.06. On January first there were 235 cases on hand. Boxes of apples packed 1,060, of which 676 have been sold, leaving 930 on hand. Apples sold at 75 cents to \$1.50 a box. There were 21,891 pounds of apples canned, netting the growers \$10 a ton.

Car Shipments.—Barreled cherries, 19; canned cherries, 2; dried prunes, 20; canned goods, 15; potatoes, 15; a total of 71 cars.

The association supplied 350 barrels of lime-sulphur to its members during the spraying season. Total value of business done last year, \$124,392.78, an increase of \$4,251.75 over that of the year before. Amount paid growers for fruit was \$51,996.41, an increase of \$6,596.41. There are 167 stockholders at the present time, an increase of 28 over the previous year. Thirty were added and two dropped during the year.

While the tellers were counting the votes for directors, President McCornack addressed a few remarks to the members present, reviewing the past year. He pointed out the success with which the Eugene association has met and indicated some of the dangers which co-operative associations have to meet. In order for societies of this sort to succeed they must have absolute confidence in the integrity of their manager. A danger to be avoided is the tendency of some members to sell outside of the association, thinking they can get better prices than within the

association. When this is done only a few of the stockholders have a direct interest in the success of the association, so work it to make their profits as large as possible, and the ends of co-operation are defeated. In this connection he urged members to sign up contracts to sell their fruits and produce through the association. By so doing the association can get into the market and make contracts for the delivery of certain amounts of produce and not be compelled to seek buyers after the regular season because more of some lines is offered to the association than it had arranged to sell. He also recommended an increase of 25 per cent in the selling price of the stock remaining unsold.

Immediately after the close of the annual meeting the newly elected directors met and elected the following officers: President, H. F. McCornack; vice-president, J. Beebe; secretary, J. O. Holt; treasurer, First National Bank; manager, J. O. Holt. The following important resolution was passed: Resolved, that 500 shares of the capital stock be retired from the market and that the remaining 211 shares be offered at par until April 1, 1912, and that after that date the price shall be advanced 25 per cent on all treasury stock offered for sale.

Northwestern Apples Popular in Germany

By United States Consul General at Hamburg, Germany

FRESH apple imports into Germany increased enormously in 1911, shipments from the United States alone increasing over 100 per cent. Imports of dried fruit of the classes in which the United States is interested were substantially the same as in 1910. The enormous proportions of this business are shown in the following table:

Classes	1911	1910
Fresh apples.....	\$10,148,320	\$4,025,056
Dried apples.....	1,974,448	1,776,194
Apple waste.....	58,548	163,268
Dried apricots and peaches.....	539,780	611,898
Dried prunes.....	3,012,604	3,481,226
Totals.....	\$15,733,700	\$10,057,642

The conditions under which the American share in the above business was obtained showed a considerable improvement in the methods of handling fresh and dried fruit, both in Germany and in the United States. The publicity given to complaints from the German side during the last two years has been heeded by American exporters, and the number of complaints in regard to unsatisfactory deliveries from one cause or another has diminished. Nevertheless there is still room for improvement. The total importation of fresh apples into Germany amounted to 122,048.8 tons in 1910 and 306,761.5 tons in 1911 (ton equals 2,204.6 pounds). Of these imports 23,569.1 tons were subject to duty in 1910 and 37,525.7 tons in 1911. Of the dutiable imports the United States supplied 5,120.7 tons in 1910 and 11,054.8 tons in 1911; Canada, 152.1 tons and 6,837.8 tons in the same years, and Australia 1,449.6 tons and 1,578.6 tons, respectively. (There is no

duty on fresh apples imported into Germany between September 1 and November 30, during which time they do not compete with the German fruit.)

In regard to this business the following observations were received from one of the largest and best known importing firms in Hamburg, which is the distributing center for this part of Europe: "Owing to the very short fruit crop on the European continent the imports of American and Canadian apples have been comparatively large since the beginning of the season. The apples coming from the eastern part of the United States landed in the beginning in good condition and sold at very satisfactory prices. This, however, lasted only a few weeks, since which all arrivals have landed in more or less bad condition; considering this the prices realized have been fairly good, owing to a very strong demand, but nevertheless losses were sustained all around, and sometimes very severe losses. We are under the impression that nobody can be blamed for the poor arrivals, but that unfavorable weather conditions during the time of growing and harvesting are responsible for the poor keeping quality this season. Shipments have again started in a small way since the beginning of the month, and as present shipments are being taken out of the cold storage warehouses we believe that they will land in good condition and fetch satisfactory prices. Apples from the Western States are, without exception, being shipped in boxes, and have arrived here in fairly

large quantities and sold until the beginning of December at fairly good prices, and recently at very satisfactory prices. We are of the opinion that until April good prices will be obtainable for this kind of fruit. Regarding packing, we wish to say that apples from the Eastern States packed and shipped in barrels were very often not honestly and carefully graded. It is very essential, in order to maintain the trade, that the packers endeavor to improve the packing. The shippers from the Western States, who pack all their fruit in boxes, have always given very honest and careful packing, and consequently are gaining fast in favor with the dealers and public at large. As it no doubt will interest you, we wish to add that owing to a very large crop in Nova Scotia about 150,000 barrels have been shipped from this province of Canada to Hamburg, and, considering the quality, they have been sold at satisfactory prices."

The total German importations of dried apples amounted to 10,413.5 tons in 1910 and 11,522.5 tons in 1911, whereof the United States supplied 9,356.5 and 10,221 tons, respectively. Dried apple and pear skins and cores totaled 3,117.8 tons in 1910 and 1,118.2 in 1911, the United States supplying 2,979.2 and 988.3 tons, respectively. Dried apricots and peaches were imported to the extent of 1,118.2 tons in 1910 and 2,326.6 tons in 1911, the share of the United States in this trade being 2,588.7 and 2,173.5 tons, respectively. Of the total imports of dried plums, amounting to 32,809.3 tons in 1910 and 28,382.2 tons in 1911, the United States supplied, respectively, 15,513.9 and 4,569.9 tons; Servia, 8,846.6 and 13,439.5 tons; France, 2,251.5 and 3,172 tons, and Austria-Hungary 5,770.5 and 6,350.7 tons. The total imports of dried cherries and prunelles amounted to 1,348.6 tons in 1910 and 1,305.6 tons in 1911, the share of the United States being too small to receive separate mention in the statistical returns.

The following letter received from another important Hamburg importing firm deals particularly with shipping difficulties, which should be done away with as far as possible, and which may be expected to be less vexatious a year or two hence when the Panama canal makes it possible to ship through by direct steamer from the Pacific Coast to European ports: "Last year the business in dried fruits with the Eastern States, as well as with the Western States, was very large, and in general pursued a very favorable course. With few exceptions the prices of most of the products show considerable increase, but were subject to greater or less fluctuation, and the business has, as already mentioned, reached a very great extent, starting early in 1911 as a consequence of the heavy drought existing in the European states during the past summer, which affected German fruit crops especially. Regarding experiences met with in connection with this season's deliveries from the United States the following points are the most impor-

tant ones which gave cause for complaints and claims, and in the interest of future business it would seem necessary to do away with them. (1) Shipments via Tehuantepec especially show a considerable increase during the last year, but show that the present method of transportation, that of sending the goods from San Francisco to Tehuantepec by steamer and later from Puerto Mexico to Europe is entirely inadequate. First, the shipments were made only in part from San Francisco, and then not on time, so that they reached Tehuantepec in the hot season, and after being transported overland to Puerto Mexico were again stored for several weeks, undergoing much heat waiting for reshipment to Europe. All these circumstances reacted to cause a loss to the buyers, inasmuch as the goods are sold as a rule upon three days' sight draft and arrived two or three months after being paid for; buyers, therefore, were driven into a corner through the tying up of their capital and the loss of interest. As a rule shipments via the United States take only four to six weeks in transit, but this time shipments made last October did not arrive in Hamburg until the recent cold spell, causing considerable expense to the receivers, and these goods were intended for special Christmas trade.

Some American houses, in order to comply with their terms of shipment, considering that through prevailing circumstances shipments could not be made in time, received bills of lading from the steamship owners which read, 'Received for shipment' instead of the usual clause, 'Shipped on such and such steamer.' According to this wording the ship owners had free choice to ship at any time suitable to them goods received for shipment via their line, and which naturally depended upon ship room available, and the later owners of these bills of lading lose all claims against the steamship company, even though the shipment is made months afterward. Our urgent advice, therefore, is the avoidance of these irregularities, and we should ask you to do everything possible to attain this end. At any rate local buyers have come to the conclusion that they will not accept bills of lading containing the clause 'Received for shipment.' (2) In order to expedite the business some of the representatives in Hamburg have succeeded in influencing the buyers to declare that they agree to the certificates as to weight and quality issued by the American experts and sworn weighers. It is only in the last year that this method has been shown to be reliable."

Annual Meeting Rogue River Association

From Medford (Oregon) Sun

ENTHUSIASTICALLY indorsing the plan of Manager K. S. Miller to form a selling union with Hood River and Wenatchee, and delegating a committee of three, W. I. Vawter, R. C. Washburn and K. S. Miller, to meet with representatives from these districts in Portland Thursday morning to perfect plans for such an agreement, the annual meeting of the Rogue River Fruit and Produce Association came to an end Tuesday night. The session was held throughout the day, from early morning until evening, and matters of importance to the association were exhaustively discussed. Although in extent of output the report of the association is below that of 1911, the members were pleased with the business-like and efficient management of the year, and a vote of thanks was extended K. S. Miller for his capable services. After the election of directors for the new year, Colonel R. C. Washburn was re-elected president and A. C. Randall vice-president. The secretary will be chosen later. The total number of cars shipped by the association is as follows:

	Cars	Boxes	Total
Pears	87	45,049	
Apples	30	20,071	
Totals	117	65,120	

The following table shows the number of boxes shipped from each station:

From	Pears	Apples	Total
Medford	15,181	7,279	22,560
Voorhies	22,535	762	23,297
Phoenix	5,992	3,244	9,236
Grants Pass	1,341	1,176	2,817
Talent	.....	4,410	4,410
Central Point	.....	610	610
Eagle Point	.....	2,190	2,190
Totals	45,049	20,071	65,120

	Fancy	Choice		
	4-Tier	5-Tier	4-Tier	5-Tier
Bartletts	\$1.12	\$.785	\$.80	\$.718
Clairgeau	1.245	1.233	.987	.95
Howells	2.245	2.207	1.979	1.962
Anjous	2.21	2.329	2.00	1.884
Bose	2.56	2.54	2.018	2.051
Winter Nelis	2.12	2.034	.....	.....
Comice*	.....	.....	2.35	1.012
Comice	.....	.....	2.80	1.133
Newtowns	1.99	1.53	1.20	.....
Ben Davis	1.00	.....	.....	.....

* Half boxes.

The following directors were elected: R. C. Washburn, A. C. Allen, R. H. Parsons, A. C. Fiero, A. C. Randall, H. E. Gale, H. T. Pritchard, H. Wood, E. S. Palmer, C. W. Potter, C. H. Gillett, A. S. V. Carpenter, F. E. Merrick, C. E. Whistler, G. A. Hover.

The annual report to the stockholders for the year closing January 31, 1912, was as follows:

Assets	
Warehouses and real estate	\$14,989.64
Merchandise (inventory)	16,556.62
Accounts receivable	3,607.64
Balance, 1911	5,294.56
Stock subscription due	3,519.58
Cash on hand	1,370.48
Total	\$45,328.52

Liabilities	
Capital stock subscribed	\$27,830.00
Bills payable	2,500.00
Accounts payable	7,104.85
Due fruit growers	1,095.08
Surplus, 1910	5,400.07
Surplus, 1910 (subject to adjustment)	1,408.52
Total	\$45,338.52

Loss, 1911	
Depreciation on warehouses	\$ 2,050.37
General expense	12,520.47
Packing houses	73.28
Total	\$14,644.12

Gain, 1911	
Miscellaneous accounts	\$ 410.62
Commission account, 1911	5,694.10
Real estate	700.00
Rent	138.25
Profit on merchandise	2,406.59
Balance, 1911	5,294.56
Total	\$14,644.12

Orchard Survey of Ontario County, New York

From the Fruit Man's Guide

CORNELL BULLETIN No. 307 gives the result of the apple orchard survey of Ontario County, recently completed by H. M. Martin, under direction of John Craig, professor of agriculture. The following excerpts are of general interest. Apple growing in Ontario County dates back to the time of the Indian, says the bulletin. Some of the old trees still remain, but most of the orchards were cut down by General Sullivan during his raid in 1779. Near Seneca Castle the Indians planted a small orchard which General Sullivan did not cut down. It was called the Indian Castle orchard. Most of the orchards of the early settlers in this section were grown from seeds taken from this old Indian orchard. Ontario County has been the birthplace of several varieties of apples, one being the Northern Spy, an apple occupying the third place on the list of apples of commercial importance.

The twelfth census of the United States, 1900, gives the value of all the orchard products for the State of New York as \$10,542,272, and of Ontario County as \$497,354. The number of apple trees of bearing age at that time was 419,483, and the yield 933,764 bushels. Ontario County occupied fifth place among the counties of the state in the value of orchard products. Eighty-nine per cent of the orchards are in the eastern half of the county, and are concentrated mainly in the southeastern part around Seneca Castle, Geneva, Stanley and Hall's Corners. The four-year average yield per acre is 58.4 barrels; the four-year average income is \$111.51. The typical four-year average yield per acre is between 40 and 60 barrels; the majority of the orchards produce less than sixty barrels. The typical income per acre is between \$80 and \$120. About 55 per cent of the orchards are below \$120.

The typical size of apple orchards in Ontario County is two acres, although the medium is five acres, and the mean size between seven and eight acres. The smaller orchards as a rule give better results than the larger orchards. Orchards of three acres or less yield on the average about 66 barrels per acre, with an income of \$123; orchards of twenty acres or more yield less than 50 barrels per acre, with an income of \$106.32. Five per cent of the orchards are reported in very good condition, 40 per cent in good condition, while over half the orchards are either fair or poor. The four-year average yield per acre of the poor orchards is 48 barrels, with an income of \$81; the very good orchards produce 77 barrels per acre on the average and income of \$172; those in good condition produce 65 barrels, with an income of \$126.

Over 45 per cent of the orchards slope toward the east, about 18 per cent slope toward the west, while 7.3 per cent are level. The orchards that are level have the highest yield, 68 barrels per acre, with an income of \$133. Those

sloping to the west are the lowest in the scale.

Orchards between thirty and thirty-four years of age are most frequently met in Ontario County. Seventy-nine per cent of the orchards are thirty years old or more, and 14 per cent are fifty years old or more. Orchards of young trees are comparatively few.

The greatest yield per acre is produced by the orchards between twenty-five and twenty-nine years old, and by those between fifty and fifty-nine years old, both groups producing practically sixty-five barrels per acre. The largest income is produced by orchards between forty and forty-four years old. The chief commercial varieties planted in the county are Baldwin, Rhode Island, Northern Spy, Tompkins King and Roxbury. Practically all of the orchards are planted either on the square or rectangular plan. The typical distance is 33x33 feet. The general practice is to prune every year, yet the general character of the pruning is only fair. Less than 24 per cent of the orchards are well pruned. The chief method of pruning is to thin out the trees a little.

The chief soil types are the gravelly and sandy loams, which produce the highest yields and incomes. The highest yield, 63 barrels, is produced on sandy loam. Sixty-four per cent of the orchards are either wholly or partly tile drained, yet only 49 per cent are reported as having good drainage. Natural drainage produces the highest yield and income (67 barrels per acre being the four-year average yield and the income \$120). Orchards in sod are the general rule. Fourteen per cent have been tilled five years or more.

The highest yield and income are produced by orchards tilled five years or more; the yield for such orchards is 61 barrels, and the income \$133 on the average for four years. As a rule sod

orchards are not pastured. In orchards which are pastured hogs are the chief animals used, although sheep are pastured to a considerable extent. Sod orchards pastured with hogs and sheep yield the highest returns. Such orchards have a four-year average yield of 63 barrels per acre, with an income of \$122. In general, hogs seem a little more valuable in pasturing orchards than sheep. Cattle and horses are destructive.

The chief fertilizer used is stable manure, which is used by 76 per cent of the growers, either alone or in combination with commercial fertilizer, green manure or both. Commercial fertilizers and cover crops are not very generally used. Orchards that are not fertilized have a four-year average yield of 44 barrels per acre and an income of \$71.54. The highest average income occurs for orchards treated with stable manure and commercial fertilizer, being \$125.95. Stable manure applied at the rate of ten to fifteen loads per acre every year, or fifteen to twenty loads every other year, results in high yields and incomes of about \$147 per acre.

The chief orchard pest reported is the blister mite, which was found in 305 orchards. The codling moth and tussock moth are the chief chewing insects reported. Of plant diseases canker and twig blight are most troublesome. Thirty-four per cent of the orchards are actually unsprayed, and over half the orchards are essentially unsprayed. Bordeaux is the chief spray mixture used. Less than a third of the orchardists are reported as using arsenical poisons. Only about 6 per cent are using sprays, such as lime and sulphur, to combat sucking or scale insects. Unsprayed orchards yield 40.2 barrels per acre on the average for four years, with an income of \$67.66. The orchards sprayed once are not much higher in yield and income. The highest income is produced by the orchards sprayed three times, which have an average income of \$140.26.

Manufacturing Basis for Tillers of the Soil

By R. A. Baker, Nampa, Idaho

BEING a firm believer in the principles and fundamental factors underlying the success of the late David Rankin, Missouri's millionaire farmer, that no matter what the first cost of an implement had been, or its then good condition, if the same could be replaced by an implement that would produce a greater maximum amount of work at a saving of time and labor, efficiency considered, the old tool would be discarded and the new tool purchased. Mr. Rankin attributed his success to preventing time leakage, short cuts in every branch, the best tools regardless of price, system in every detail and in selecting men with brains, not mere machines without brains. Andrew Carnegie, the steel king, saw visions of profit of the greater profits in the most modern inventions; machinery costing thousands of dollars was relegated to

the scrap pile and the greatest labor and time-saving machinery was then installed. In every station and vocation of life we have the theorist, the visionary man, the man who has better foresight than many of us have after-sight, and who in a great many instances is the laughing stock of the practical man, yet in a sense the practical man is but the tool of the visionary man. Luther Burbank, David Rankin and the many others of more or less note are the visionary type of men; their vision of the future was their basis of success accomplished.

We are often misguided in the selection of the implements and equipment by the advice of others or time-worn customs of certain tools for certain work. But as I have always said, farming operations are too slow for the amount of returns, hence I am always

on the alert for any new implement that would take the place of some inferior implement. About a year ago an advertisement of a new type of implement appeared in the Practical Farmer, the factory being located in



R. A. Baker, Nampa, Idaho

Illinois. I answered the advertisement, and upon receipt of the circulars, I read the modest little story of these implements with great interest. They told about the dust mulch, intense and clean cultivation in such a convincing manner that I was convinced, after studying the pictures of their implements, that they were better than I had seen or used. I ordered one each of their

BETTER FRUIT

two types and the results obtained with these tools cannot be equalled with any other two tools intended for the same purpose. I saw visions of better seed beds and cleaner orchards. It proved a boon to us, and has been a great benefit to over thirty neighbors and acquaintances who have bought them in the past year, since I first took the initial step in purchasing the implement of the radical different type than the ones in use. I have found the machine to have the disk action without the lifting, the Acme harrow action, with distinct advantages of adjustment; the drag harrow action, with quicker adjustment and teeth in line, also the leveler and clod crusher attached. In other words, a combination of four distinct types of time-tried implements in one without excessive draft, an implement that has saved us time and money on any class of farm work in handling the soil. We must know the exact cost of preparing the soil of an acre for any crop; we must know the cost of cultivating an acre of orchard, not keep working on the same until it is about right, but it must be right in a given time, and so on, with all operations they must have a fixed time limit just the same as a part of a buggy, sewing machine or any other manufactured article. The manufacturing basis must prevail on the farm for profitable and best results.

Cost of Shipping Fruit to Eastern Markets

From Wenatchee (Washington) Republic

WHAT does it cost for freight and refrigeration on shipments of fruit to Eastern markets? Lack of information on this essential expense item is the reason for frequent misapprehension among growers. The cost of packing soft fruits in the Eastern markets may look upon recent price quotations as good when the reverse is exactly the case. This was recently discovered by a party of Granger growers who consigned a car of pears to the market. The pears sold at \$1.25 per box, but after deducting 89 cents for freight and refrigerating charges, besides commissions, etc., the growers realized but 26 cents per box net on the carload, or about one-half cent per pound. For the information of both shippers and growers the management of the Yakima Valley Fruitgrowers' Association has prepared a table showing the freight and refrigerator rates on the different classes of fruit from Selah, North Yakima, Kennewick and points between on soft fruits.

Eastern cities are divided into five groups, and the freight per hundred refrigeration charge per car and combined expense per hundredweight are figured out for each group as follows: Group 1—Kansas City, St. Joseph, Minneapolis, St. Paul, Omaha and Sioux City; freight, \$1.12½ per hundred; refrigeration, \$40 per car; combined rate, \$1.29½ per hundred. Group 2—Chicago, St. Louis and Milwaukee; freight, \$1.25; refrigeration, \$45; com-

bined rate, \$1.43¾ per hundred. Group 3—Detroit, Cincinnati, Cleveland, Buffalo, Toledo, Pittsburg, Indianapolis and Louisville; freight, \$1.50; refrigeration, \$55; combined rate, \$1.75½ per hundred. Group 4—Toronto, Montreal, Philadelphia, New York and Baltimore; freight, \$1.50; refrigeration, \$57.50; combined rate, \$1.74 per hundred. Group 5—Boston; freight, \$1.55; refrigeration, \$62.50; combined rate, \$1.81.

The charges per box for freight and refrigeration on different kinds of fruit are figured out in the table as follows: Apricots, prunes and grapes, first group, 34 cents; second group, 37½ cents; third group, 45 cents; fourth group, 45 cents; Boston, 47 cents. Peaches, first group, 26 cents; second group, 29 cents; third group, 34½ cents; fourth group, 34½ cents; Boston, 36 cents. Pears, first group, 66 cents; second group, 76½ cents; third group, 88 cents; fourth group, 88½ cents; Boston, 92 cents. Plums and prunes, in six-inch peach boxes, first group, 34½ cents; second group, 41½ cents; fourth group, 50 cents; Boston, 52 cents.

These rates apply on a car of the minimum weight of 24,000 pounds and are based on the following weights per package: Apricots, five-inch box, 26 pounds; peaches, 4½-inch box, 20 pounds; 5-inch box, 21½ pounds; pears, 9-inch box, 51 pounds; 4½-inch, one-half box, 27 pounds; prunes, 5-inch box, 29 pounds; grapes, single crate, 26 pounds; double crate, 56 pounds.

Good Market for Idaho Apples

From Caldwell (Idaho) News

APPLES from Idaho have made a hit in Germany. The report of the Northwestern Fruit Exchange showing the prices which have been secured for Idaho apples contains a statement that many boxes were shipped from Idaho to the German points. Especially is this true with the smaller apples which went out from Plymouth and Boise during the season. In one car of Boise apples there were 439 boxes of the five-tier grade. The fruitgrowers of the Northwest have been getting the benefit of the prices in Europe when the demand for apples was slight and the price weak at home. The goods are often shipped to Eastern points and held in cold storage there until the right time has come for a shipment to the markets across the water. Most of the sales, the exchange points out, have been made minus the freight charges, that is, sold on board the cars at the shipping points. Idaho apples have created a strong demand in the markets of Germany, Northwestern fruitgrowers have learned. The quality of the goods and the uniformity of the pack has satisfied the buyers there. The report of the exchange shows that the prices have held remarkably well through the season. Following is the price given to Idaho apples at the shipping point before they were carried to the German markets:

For New Plymouth Fruit Growers' Union—630 boxes Gano and Ben Davis; gross invoice price f.o.b. shipping point, \$739.37.

Prices in detail	Tier	Per Box
Gano, extra fancy.....	4	\$1.75
Gano, extra fancy.....	4½	1.45
Gano, extra fancy.....	5	1.20
Gano, standard	3½	1.65
Gano, standard	4	1.45
Gano, standard	5	1.05
Gano, C grade	3½	1.37½
Gano, C grade	4	1.00
Gano, C grade	5	.80
Ben Davis, standard	3½	1.35
Ben Davis, standard	4	1.10
Ben Davis, standard	4½	1.10
Ben Davis, standard	5	.82

For New Plymouth Fruit Growers' Union—630 boxes Ben Davis and Delaware Reds; gross invoice price f.o.b. shipping point, \$745.72.

Prices in detail	Tier	Per Box
Ben Davis, standard	3½	\$1.35
Ben Davis, standard	4	1.10
Ben Davis, standard	4½	1.00
Ben Davis, standard	5	.90
Ben Davis, C grade.....	3½	1.00
Ben Davis, C grade.....	4	1.00
Ben Davis, C grade.....	4½	.80
Ben Davis, C grade.....	5	.75
Delaware Reds, extra fancy.....	4	1.75
Delaware Reds, extra fancy.....	4½	1.55
Delaware Reds, extra fancy.....	5	1.35
Delaware Reds, standard	3½	1.49
Delaware Reds, standard	4	1.45
Delaware Reds, standard	4½	1.35
Delaware Reds, standard	5	1.10
Delaware Beds, C grade	3½	1.10
Delaware Reds, C grade	4	1.00
Delaware Reds, C grade	4½	.90
Delaware Reds, C grade	5	.75

For Manville Fruit Company, Boise, Idaho—630 boxes mixed varieties; gross invoice price f.o.b. shipping point, \$1,003.35.

Prices in detail	Tier	Per Box
Imp. Winesaps, extra fancy....	4½	\$2.20
Imp. Winesaps, extra fancy....	5	1.55
Imp. Winesaps, standard.....	4	2.00
Imp. Winesaps, standard.....	4½	1.75
Imp. Winesaps, standard.....	5	1.25
York Imperials, extra fancy.....	4	1.50
York Imperials, extra fancy.....	4½	1.35
York Imperials, standard.....	4	1.35
York Imperials, standard.....	4½	1.25
York Imperials, standard.....	5	1.10
Aiken Red, extra fancy.....	5	1.15
Winter Rambo, standard	5	.90

Four hundred and thirty-nine boxes in this car with 5-tier apples.

Essential Elements of A Successful Home in the Country

Address of Joseph Wing at First National Country Life Congress, Spokane, Washington
(Introduction by August Wolf)

THE three essential elements of a country home are: A shelter, a good woman and a fireside. The successful country home is a little republic where children get their first and most important world training. The right sort of country home both shelters the child's body and trains it in use and efficiency. The right sort of country home develops in the child helpfulness, self-reliance, industry and unselfishness. It is the most perfect training for well rounded and complete development of the child yet discovered. The three principal elements of the country home, the woman, the man and the house or environment, are each well worth study. Being a man, I will assume that the man is finished, complete, perfected and incapable of change. The house in which is staged the country home is easily improvable. It should contain these factors: Abundant room, small size, ease of use, bath, sunlight and open fire. The central figure of the country home is the woman in it. To the country home she is wife, mother, cook, maid, laundress and chief source of joy and comfort. The woman of the country home is overworked. There is need of conservation of farm womanhood more than of any other one thing in America. Woman's cheery smiles, welling up from a happy, unexhausted body, are worth more than immaculate housekeeping or coarse dinners. Simpler farm-house living, with labor-sharing in the home, will preserve the better part of the farm woman. As a joy giver the possibilities of the farm woman have not yet been revealed, because we have wasted her energies in over-much service.

I can imagine a being from Mars, making a study of conditions in this world of ours, writing of his observations like this: "Homes. Certain animals and birds on the world make for themselves homes. These are places where they retreat for rest, sleep, defense and chiefly for the purpose of rearing their young. Of the animals of the world the most intelligent is called man, and he builds the largest and best home. It is observable that in lands where homes most abound there is found most development, both in material and moral sense. Man seems an animal safe, sane, happy and orderly when attached to his home, subject to many strange aberrations and disorders when separated from his home. The nations of the world that have strongest developed the home-making instinct are the wealthiest, strongest, most progressive and happy nations."

What is a home? First, it is a spot of earth somewhere on which is some sort of shelter from the weather, from too curious gaze of the world. Conceivably it is a room or collection of rooms in some great apartment house.

It takes, however, a vigorous stretch of imagination to call rooms in a flat "home." "Home" means, in its natural sense, a spot of earth, not hired, but owned, with some sort of house on it. Second, home means a spot where there is, has been, or will be, a good woman. It is impossible to conceive of "home" apart from wife, mother or daughter. There must be a woman there—a woman who watches for your coming. A home is, then, a place that you can own, a little bit of God's earth, on which you are king, where you can plant things and watch them grow, where you can build and adorn, a spot where you can retreat and feel yourself safe, a place where you can take a wife, where she can bear children and you can watch them grow up and develop. There are, however, many sorts of homes in the world. Let us consider the best sort, the sort that breeds most happiness and that most strengthens the state.

The happiest homes have these factors: Husband and wife fairly well mated, loving each other, forgiving each other their transgressions, fairly patient with each other and united in common bond of ideals, labor and hope; children who develop there; a spot of land large enough for planting things and watching them grow. There must be grass, trees, flowers, planted, cared for, watched by the father, mother and children. A house with fireside, with warmth, light, fresh air, with books and pictures and means to teach the young minds of the labor, hopes, ideals, works of the world in which we live. A united community of feeling in the little republic that constitutes the home. The husband and wife loving each other, proud of each other, glad to forgive each other, happy with each other. The children obedient, teachable, proud of their parents, and from having better advantages growing up better than their parents. The parents according to the children all their rights, their rights to be well born, to sleep in the open air, to eat plain, nourishing food to build their bodies strong, their rights to ask questions and have them answered, their rights to laugh and play, their rights to share responsibilities, to share labor, to early learn the joy that comes from task well done, from rest well earned. The ideal home, then, is the home on the farm, for there only can it be separated far enough from other homes to make it a true republic, autonomous, a house on the farm set in a good sized lawn, where one can plant things and watch them grow and love them; a house, be it ever so small, that lets in the sun, that has, if possible, an open fire, that holds the good woman, the loving husband, the children.

The farm is the one place where these things can at present time be assembled. Nowhere else are there proper opportunities for space, for

light and air and sun, for room for planting things; nowhere else a chance for the children to learn to labor, to become a part of the industrial life of the republic of home, to learn to develop that sense of responsibility and of duty that goes to make the strong manhood and womanhood in the world. The chance of achieving greatness is best with the child that develops on the farm. What is greatness? There are perhaps two chief sorts of greatness, destructive greatness, seen in military life, the greatness of Napoleon and of Geronimo, and constructive greatness, seen in our innumerable company of great men from Washington, Jefferson and Lincoln down to our own day, when Roosevelt lives on his farm and watches his meadows bloom, and Bryan, who rejoices in his crops of alfalfa and corn. As men grow older they see the true perspective of things more clearly, they recognize the true values of things. It was Thomas Jefferson who wrote to a friend, after his retirement to his farm, "I infinitely prefer the peaceful contemplation of my growing potatoes and lucerne to again striving in affairs of state." Washington loved his Mount Vernon farm and retired to it with serene joy. I have known in my day a goodly number of great men. I can tell you a secret about them and about their greatness. Nearly all of them are just ordinary men, with a little better, stronger brain perhaps than the rest of us, but the truly great ones among them, men like our great president, are great because they have learned from childhood three simple things: A feeling of responsibility in life, a habit of labor, a love of the common every-day things, grass and trees, flowers and fruits, a love of the common people. These are the things, when one has them most developed, that make men greatest. Abraham Lincoln was born on a farm. It was an humble farm home, but it had all the essentials. There was the separation, it was a part by itself. There was the good woman, with love in her heart. There was the open fire, beside which young Abe read and studied, and where he dreamed dreams that so much more than came true. There was the need, the habit, the joy of labor. There were books, not too many, but good books. The woman, with love in her heart and sound sense in her head, the labor, the open fire, the books! Could any boy have anything better than that? That is all that I am pleading for today, that we shall bear these things yet steadily in mind in considering what to make a country home. That it shall have in it a woman, good, loving and wise. That it shall have an open fire and good books. That it shall have children and opportunity, and need, that they shall labor at useful tasks.

The home upon the farm. It is objected that there is isolation there.

True, and that is the strong point in its favor, if the father and mother are what they ought to be. The little republic of the farm, the home its capital and center, is best conserved if it is out by itself. Then all thought, all interest nearly, centers around the farm and around the home. In concentration of thought and effort come success. Can you imagine Abraham Lincoln growing up to be what he was, and is, had he spent his evenings in a village watching the five-cent moving picture shows? Danger of selfishness, of narrowness? Somewhat, yes, but Uncle Sam removes that danger. The best thought of the world comes to your table, the best books of the world may rest upon your shelves; no matter how remote your farm, you get a chance to read them when you are out of sight of the electric lights of the village. What chance has the lad in town? In the morning he reads the morning newspaper, chiefly about the tar party and the murder in Virginia. In the evening he reads the evening paper, rehashing the non-important news of the morning, only made a little more yellow. The human brain is like a honeycomb, made up of cells, each one capable of receiving an impression, but there is a certain definite number of cells given to each one of us. If you store one cell with a bit of rotten information and another with a bit of useless knowledge, gleaned from our often viciously edited daily papers, you have simply filled these cells that might have stored good, strong, helpful truth with trash, or worse than trash. Can you imagine Abraham Lincoln the man that he became had he filled his brain day and night with the stuff that village and city people read today? The isolation, the few good books read over and over again—these made him strong, wise, clear of vision. Always the strong men come from the country, from country living. It is not chance, this; it is because in country living is opportunity for storing the brain with good things, as well as for development of habits of work and of accepting responsibilities.

The successful farm-house ought not to be on a high foundation. English country houses are usually entered on the level of the lawn. Two steps above this level is the utmost that a country house should have. It looks better, is more homey, saves enormously the housewife's strength to put the house nearly on the level of the lawn. Lighting the basement is easily done by small areaways of the basement windows. Mistakenly, some country folks imagine a house to have a "grander" look to be set up on a high foundation. Possibly it is, but it is not so homey, nor so good in any way. It had better be solid and square, not made up of many narrow wings diverging in all directions. The solid, square house is cheaper, easier warmed, more convenient of arrangement, easier for the housewife to keep. It ought not to be too large. We are in a rapidly changing age, that for some reasons

not clearly understood young women are today unwilling to help in the homes, though they are glad to be "salesladies," at starvation wages, in department stores or factory operatives. The housewife is pretty sure in the future to do her own work, with what aid she can get from her own children. Do not, then, build that new country house too large. Omit as much as you can of the non-essentials. Here are the things that I do not see how you can leave out, assuming that you have the means with which to build them: A living room with an open fire. Let the living room be a fairly large one. You can as well as not dine in it. A good size for the family living room in the farm-house is 15x24 feet. Economy may decide you to lessen these dimensions; a width of fourteen feet will serve, a length of twenty feet, if means pinch. Put the fireplace in one corner. Make big windows that let in the sun and let you see the view. A sunny, convenient kitchen with a good pantry next, and convenient to it a milk room, fruit cellar, and so on, all so arranged as to save the labor of the housewife. See that in a large sink there is hot and cold water piped; build a big wood box to this kitchen, so arranged that it can be filled from the outside. See to it that there is not one step up or down needed in using this room. Make it fairly large, but not too large, as unnecessary size spells unnecessary labor. A moderately large kitchen, properly arranged, is better than a big one, and yet in a sunny, clean, homey kitchen the family can eat the breakfast in comfort; in fact most of the great men of America have often eaten breakfast in the kitchen. It simply saves a little labor for the housewife. Have a big, screened, cement-floored north porch adjacent to the kitchen. All of America has hot summers. All of America has flies and, I fear, will always have flies. On this screened porch the summer kitchening will be largely done. There should be a bathroom with sanitary water closet. Bathrooms cost little or much, as you prefer. I have used a bathroom where we pumped directly into the tub with a four-dollar pitcher pump. I do not like that sort of bathroom, but it is better than none. A bathroom equipment, pretty good, with enameled tubs and all needed fixtures, can be bought for seventy-five dollars or less. I am putting in the rooms in order of their relative importance and I place the bathroom third. If you can afford a parlor don't build it, but put in two bathrooms, one above and one next the kitchen. Plenty of bedrooms are needed. They need not be large. We have learned the comfort of sleeping alone; children also love to sleep alone. A single bed takes little room, nor do the simple necessary things in a bedroom take much room. We do not now ever shut the windows in our bedrooms at night, so we need not provide a lot of air in the fall to last until spring, as was done in the good old days of our fathers, when from October bedroom

windows were fast closed until May. Anyone who has lived on shipboard or on sleeping cars has learned that one can sleep just as well in a small room as in one sixteen feet square. The only objection to the big bedroom is that if one has enough of them they make so big a house, so costly to build, warm and keep. By "large" closets I mean at least four feet square. If you must make them shallow make the doors large, or double, so that when they are opened the whole closet front is opened. Many a man puts space into bedrooms that ought to be put into closets. No bedroom without a closet should be the rule. Good, big sleeping porches are requisite. They should be wide enough so the storm won't blow in. Cease experimenting with sleeping out of doors. Boldly move out with your beds and stay out. That is a reason for the small bedrooms—you won't need them much, except as dressing rooms and occasionally during some unusually bad storm. At Woodland farm, in Ohio, our boys have not had a bed in their own bedrooms for years. An unusual vigor and health comes from sleeping out of doors; unusual enjoyment and happiness, too. Make the sleeping porch face the side of the house whence come fewest storms. Usually that will be the south side. Low ceilings are the most artistic and homey, also the most powerful. Low ceilings mean easy stairs to climb. That means a wonderful conservation of energy on the part of the housewife. I know two country houses within sight of each other. In one the lower story has ceilings eight feet six inches high, the other one eleven feet six inches. The one with the lower ceiling is conceded to be the most artistic and beautiful in proportion. The woman in the one home climbs stairs three feet higher than the woman in the other home. Thus each trip makes her six feet of up and down more than has the woman who lives in the other house. Say there are ten journeys daily to the upper floor, it amounts to a saving in climbing up and down of 21,600 feet in a year. The woman in that house of easy stairs is growing younger year by year, while the other woman is becoming broken down, and that 21,600 feet of needless climb is responsible in large part for her decay of health and strength. Why did they do such a thing? Because the architect specified it so. Architects sometimes need guidance; they have not always conceived that the vital thing about a house is to make it fit the life that lives in it.

There are many real advantages to the open fire. If the chimney is good it ventilates the house nearly perfectly. It should have a big throat, of the same size all the way up. Purer is the air with eight-foot ceilings, if there is an open fire, than with fourteen-foot ceilings and no open fire. Tuberculosis came quick to New England when the fireplaces were closed and the tight iron stoves took their place. The fireside is the soul of a house. About

the blazing fire gather young and old, grave and gay, grandfather and grandmother with their silver hair and their loving smiles, father and mother, with children great and small, while it is curious if the collie dog does not lie watching the coals and the cat sit mute in the chimney corner. The child may easily learn more at the fireside than at college. It is the heart and soul of the home. There, about the evening fire, are learned unconsciously many lessons that go to make for home loving, for morality, for good citizenship. I used to wonder at the different standards of morality of some people in the world, revolting to our sense of what is good and pure and right, but I wondered no longer when I learned that these people have never known what firesides were, because they had never lived in a land where there were firesides; thus their children never had the sort of family life that comes to us from Northern Europe; thus the standards of morality became so widely different. How can the family life influence the boy if there is no fireside where they may gather evenings? How can there be a fireside without an open fire? When we wish to honor a friend will we ever learn to say, "Come in, friend, and sit by my hole in the floor, or by my hot water radiator?" If we will hold the friend, or the child, we must see to it that there is in the house the fireside where all gather of winter's evenings. There is where character forms and home love grows. Abhorrence for what is vile and home destructive comes native to the lad who has passed his evenings by the fireside at home. Did you ever hear of a girl going to a life of shame from a home where was kept a true fireside? Does not the wayward girls come from the home where the fireside is ignored, where from indifference and ignorance on the part of father and mother the outside of the house is more attractive than the inside?

Regarding the furnishing of the home I would say the simpler the better. There must be, however, some good pictures on the walls and some of the world's best books must be on the shelves. It is easy to buy these best books. They are nearly all old books. The latest "best seller" is seldom, indeed, a book worth buying. Innocent of harm, maybe, only that it displaces the good old book. Surround your young folks with the best in literature. Of periodical literature you should select the best, and do not have too many magazines. Also have your boys and girls taught to make music. If you are sure that you can be trusted to select the music indulge in a good phonograph. With that in your possession the world's best music is at hand.

The home should bear no tax. It is outrageous and incomprehensible that a man should be fined for undertaking to raise a family of boys and girls for the upbuilding of the state, yet that is what taxation of homes means. When I found my boys had outgrown the

little nest in which they were born I built a house of moderate size, just holding my family, with no luxuries or extravagances about it—just a good little factory for producing good men for the state. Then the state promptly stepped in and taxed or fined me seventy-five dollars a year for being, as you may say, in the boy rearing business. Was I more able to pay this tax because of having the boys? In what way is such a tax justifiable? The wealthy old bachelor, my neighbor, pays a small tax on his home. He is able to pay a large one, but the state rewards him for being a bachelor, for not undertaking to raise boys. It is time we gave earnest thought to the injustice of this. Homes should be untaxed. I do not say that palaces should be exempt, but homes should be free. If the State of Ohio were to give me a premium of seventy-five dollars a year toward feeding my boys it would be more just than to fine me seventy-five dollars for housing them.

I believe in the science of eugenics. As I understand it, that is the science of giving children right to be well born. I said one day to one of my boys, "Son, do you know why I asked your mother to marry me?" "Why, no," he replied, "I suppose it was because you were in love with her." "Yes, son, that was true, but what made me love her and wish her for my wife was the fact that I felt that I would be proud of her children." I think the lad will remember that a long time. The child has a right to be well born; the country child, having a greater future and greater responsibilities than the town child, has a doubled right. A man, too, ought to regard from boyhood his body as being a channel through which will pass on to the future the current of life—should regard his body as a sacred thing, as much so as the woman should regard hers. Fortunately, the country dwellers are today well agreed as to these things. How to live with the woman after you are married to her seems to be a problem of modern life, not so much in the country as in town. Three things seem necessary, love, comradeship, forgiveness. Love we will take for granted. Married folks usually start out with that. There's the lack of comradeship oftentimes. I feel that the lack is often caused by defective education of girls. Western girls are far more manly than Eastern girls, and are better fitted as a rule for comradeship. Their life cycles are nearer together. A jolly, sensible country woman of the East, knowing that I was coming to Spokane, asked me this, "Do you like the Western people, Mr. Wing?" "I do," I replied, "especially the Western women." "How are they different from Eastern women?" she asked. I puzzled over the question for a little time and replied, "Well, you see, they seem so natural, so interested in things that interest me, so well, so almost human." My friend laughed merrily. "I like the word 'human.' Why can't you men here in the East treat women as though

they were human and not dolls or angels, or your intellectual inferiors? A great many men visit my husband; I listen to their conversation. All of it is perfectly comprehensible to me and much of it is interesting to me, yet when they address me it is as though I were either a child or an angel, and I am neither. I think Eastern women would be glad to be human as well as Western women if the men would only give us a chance." It helps when the country woman is a true country woman, interested in all the problems of the farm and the outdoors, a comrade as well as a helpmeet to her husband. The new type of woman coming will, I hope and believe, be a woman with the brain, the force, the daring of a man, coupled with the heart and soul of a woman, than which God has made no more beautiful thing. The farmer's wife should be intelligent, interested in and taught about all manner of outdoor activities. Thus she is the better helpmeet and the happier woman. Thus she is able to better bring up sons and daughters.

There is not, in my experience, so very much money to be made in farming. There is great opportunity in home building, in development of childhood, in the joy of living. He who overlooks these profits might perhaps as well be in the smoke of cities. Don't hem in the house with a narrow, cramped dooryard. Make a big lawn about the house. Give the home room. It is worthy of it. The land is not wasted. You can plant fruit trees and ornamental trees, and shrubs and flowers. Set the house in the midst of a clear plot of grass, plant no trees near enough to the house so that should they fall they would reach the building. The sun comes in better, it is safer, more beautiful, more pleasant. Plant trees that will grow in beauty for a century. Have a plan in planting and do not shut off the pretty views, but bank your trees to screen unsightly things or to shut off the cold winds. Let the children have places to plant things and encourage them to plant things. When they begin to help they learn to love the place. The boys will not willingly leave what they have helped create. Plant hardy shrubs and hardy flowers that come up year after year. The best thing that ever came to man or woman is work. It is the best thing that ever came to child. Let the boys work by your side. Do not let them overwork, not set them at endless tasks alone. Child nature cannot endure the drudgery of tasks that seem to have no end. All work and no play makes Jack a dull boy. All play and no work makes Jack a simpleton or a jailbird. It is my experience that men, women and children are happier for regular, hard but not exhausting work. Set the child at tasks that have plainly an end in sight, and at the end let something pleasant happen. Early let him have his regular tasks and his responsibilities. It is a good thing when the lad begins to feed his rabbits.

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BETTER FRUIT

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Irrigation Engineering*, State Agricultural
College, Fort Collins

E. P. TAYLOR, *Horticulturist*, Grand Junction

IDAHO

W. H. WICKS, *Horticulturist*, Moscow

W. S. THORNBER, *Horticulturist*, Lewiston

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ADVERTISING RATES ON APPLICATION

Entered as second-class matter December 27,
1906, at the Postoffice at Hood River, Oregon,
under Act of Congress of March 3, 1879.

Cold Storage.—The International Apple Shippers' Association, the Western Fruit Jobbers and the International League of Commission Merchants have devoted a great deal of time in the interest of the fruit dealer in general and the fruitgrower as well, toward securing proper in-transit storage rates. The adoption of such a rate will be of great benefit to the fruit growing industry, particularly of the Northwest, for the reason that a proper quantity of fruit can be stored in different cold storage plants along the line between here and New York City and be distributed from these storage plants to surrounding territory or shipped further on to any distant points equally important. The wide-awake districts should give and are giving this matter serious consideration, and it is entitled to consideration. Because of the increased crops railroads will find it difficult to supply the necessary number of cars to move the crop in the required time and to lay it down in the best condition at the point of destination. With the proper amount of cold storage facilities at home, perhaps half the crop of apples could be stored and the other half sold or stored in transit as the occasion might demand, according to market conditions in any particular year. Such cold storage plants will be an important factor in the fruit industry of every fruit district in the near

future. Cold storage plants at home will be quite an item of saving to the fruitgrower for the reason that cold storage at home is no more expensive to operate than abroad, and the amount invested would be materially less for the reason that a cold storage plant at home would be built on comparatively cheap ground while cold storage plants in large cities are built on expensive ground. There are good points in favor of in-transit and cold storage at home, in fact both will be necessary to the fruitgrower. Cold storage plants at home will enable the associations to take care of the surplus for which cars cannot be secured as rapidly as needed.

Direct Shipment to the Consumer by the Individual Grower.—A fruit grower in Grand Junction who did not feel satisfied with the prices he was receiving through the association, after giving the matter considerable investigation, resolved to try the experiment of shipping his own fruit direct to the consumer and retail grocery stores by sending out a number of circular letters and quotations to the small towns that are not reached by the association. He succeeded in getting prices that were better than the average association prices, according to the statement in the Country Gentleman. He spent \$15.75 in postage and circulars, and for the fruit he received \$33 more than he would have received through the association, leaving a net return of \$17.25 to the good. It is evident that only a small quantity was handled. That small quantities of fruit could be handled in this way, cutting out retailers' profits, no one can deny. No great quantity of fruit could be handled by an individual selling direct to the consumer for the reason that when fruit is shipped any great distance the express rate would be so much greater than carload rate that he would not be able to lay the fruit down to the consumer as low as the association would, so that the distance he could ship would be very limited, and generally speaking the territory to be covered would be very small. A few years ago a dealer in a large Eastern city carried advertisements in a number of papers offering to supply direct to the consumer from the wholesaler apples at a very reasonable price and considerably lower than the average price obtained by the retailer. However, as the plan was not continued it is only fair to presume that it did not come up to expectations financially. In reference to the Grand Junction man it would seem that the association was rather at fault in not supplying these nearby markets and small express shipments. Every association should cover the field thoroughly, and particularly in reference to perishable fruits the market near at home should be worked very thoroughly, because in short distance shipments there is little loss from decay or off-condition. Some fruitgrowers have advanced the idea of the association selling direct to the

consumer. Some firms, in some lines of business, are building up quite a large trade in selling direct to the consumer, but so far as known no immense business has been done by any of the fruitgrowers by adopting this method. Other growers are suggesting the plan of having associations establish retail stores in a number of cities throughout the United States. It is true that some lines of business have retail stores in many of the large cities throughout the country, but such institutions have an immense amount of capital, running into the millions. So far fruitgrowers' associations have seldom been successful in getting capital to incorporate for more than \$50,000 or \$100,000; therefore when it comes to talking of the fruitgrower doing a direct retail business that would require many millions it does not look like a very possible plan. It must also be borne in mind that in order to conduct a retail store and make it pay a regular trade every day during every week twelve months of the year would be required in order to employ the necessary number of employees, pay the rent and other retail expenses, so when it comes to the association establishing retail stores it means they would certainly have to take on some other lines so as to be able to continue business during the entire year. It would also require capital that would run into millions. Such plans look ideal from a theoretical point of view, but from investigation it seems apparent to one familiar with business that they are next to impossible. In order to supply the consuming public in a city like New York it would probably require not only one hundred but hundreds of retail stores, push carts, etc. So far as past experience is concerned there is nothing to justify the conclusion that it would be possible to eliminate the wholesale fruit dealer or retail fruit dealer, but that much could be done to regulate retail prices and retail profits, which seem to be responsible for the great difference between the retail prices and the prices the fruitgrower receives. Much thought and time has been given to this by a great many people, but so far the problem of regulating the retail prices is still unsolved.

The Economy of Fruit Growing.—Large consumption depends on proper distribution and prices within the reach of the large consuming public. The fruit grower has given much time and thought to growing an orchard successfully, harvesting and packing his fruit properly, but little time has been given to the consideration of economy in handling his fruit. This is practically true among Western people. It is a well known fact that in the West people have made money very easily and very rapidly, and when money is easily made it is quickly spent and little care is given to economizing. If an article can be produced so as to be sold at a rea-

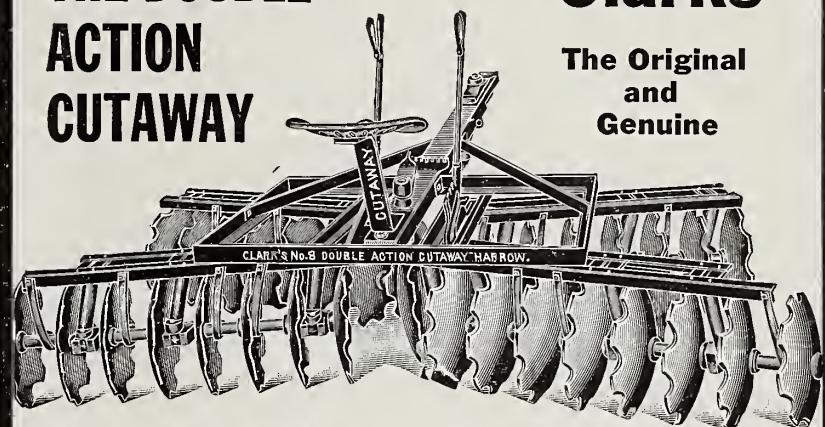
sonable figure it means increased consumption and by proper economy can still make as much profit for the producer. During the last year considerable thought and attention has been given to this feature of the fruit business, and as a result labor-saving machines have been invented for wiping and grading apples, which in the past has been done by hand. These will result in a great saving to the fruit growers, and also a great saving can be made in having proper facilities and arrangements in the packing house. It is true that too much labor is lost by lack of proper arrangements in the packing house, necessitating the handling and rehandling of fruit.

The Importance of Near-by Markets for Perishable Fruits.—It is very apparent that near-by markets have been overlooked by fruit shipping concerns in the past. With perishable fruits like strawberries, raspberries and peaches, the nearer the market the less the loss in shipment. Small fruits can be supplied in small quantities at short distance better than they can be shipped in carload lots a long distance. A few years ago the express business in strawberries at points that could be reached in small shipments in open express was doubled by correspondence in one district, and the following year, by sending a representative to make proper arrangements with the retail fruit dealers and grocers, the express business was again doubled, which showed that by proper solicitation the express business in two years at an advance price over carload quantities, was quadrupled. A year or two ago, where there was an apparent glut in the peach market, prices were so low at Eastern points that many peaches were not picked, but were allowed to rot on the ground. It was reported by traveling men that in many small towns in the eastern portion of Oregon and Washington that they were unable to obtain any peaches at the hotels. The opportunity should not be overlooked. While the amount consumed in any one of the small towns might not be large, it must be remembered that a large number of small towns will consume quite a lot of fruit. Short distances mean that fruit can be laid down with comparatively little loss. Such shipments can also be collected for promptly, which means the cash back pretty quickly, which helps the fruit grower very materially.

Fruit Growing in Indiana

TWENTY years ago the specialist in fruit growing, the commercial orchardist, was a rarity in Indiana. As a rule the few men who were interested in the business at that time were far from scientific men, and had taken up the industry because of a love for the outdoor work and for the sake of the things they grew. They had few insect enemies and fewer fungous diseases to resist, and depended almost entirely upon luck in the matter of weather and reasonable judgment in the matter of

THE DOUBLE ACTION CUTAWAY



CLARK'S NO. 8 DOUBLE ACTION CUTAWAY HARROW.

“Clarks” The Original and Genuine

Anything That Increases Crops Puts Money In Your Pocket

The Double Action Cutaway is a genuine crop increaser. The famous Slotted Cutaway Disc thoroughly pulverize the earth. The front gang moves the soil one way and back gang moves it the other -- two operations at the cost of one. Solid steel frame -- plenty of strength and no extra draft. The discs on the rear pair of gangs cut between those on the front pair, and the steel frame holds the gangs in proper position.

We Can Show You Proof Positive

that the Double Action has increased crops right here in the Northwest. We have gotten this proof up in circular form and will send it to you with the Cutaway book,

FREE! “INTENSIVE CULTIVATION” Upon receipt of this corner of this ad.

EVERYTHING IN IMPLEMENTS AND VEHICLES

Mitchell
LEWIS & STAYER CO.
Portland Spokane Boise

growing the crop. Pruning, cultivation and spraying were almost unheard of and totally unpracticed. In an almost incredible space of time conditions have changed. In spite of the weather man to the contrary, our seasons are not as they used to be. We are more subject to frosts in the spring and far more liable to suffer from dry weather in the summer. Insect pests have come in and have waxed fat, fungous diseases have encroached from the south with few attempts to check them. The fruitgrower today must be an educated man in his line, and must be a man of courage. The slipshod methods of the past must be forgotten, the future must be one of industry and relentless endeavor. The new conditions have bred a new set of men to face them.

Five years ago there were probably not a dozen men in Indiana who could use a spray pump to its greatest advantage. Three years ago the orchardists had started to wake up. A few had bought pumps, had studied their situa-

tion and were doing intelligent work. This year it is common matter to find whole neighborhoods working together on their orchards, and their results justify it. In one locality one enthusiast secured the agency for spraying materials and last spring sold over \$500 worth to his neighbors. This is not in one of the recognized "fruit centers" either, but is simply an intelligent farm section in the central part of the state. Another man in the south part of the state has sprayed his trees for years. He tells me that last spring more than one thousand dollars' worth of spray material was sold at his town—more than twenty times as much as was ever sold there before.

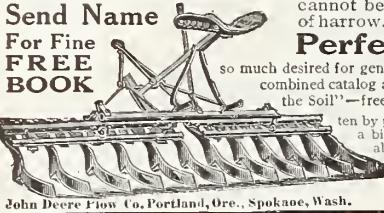
These men who are getting into this work now are to be the leaders in fruit growing in the future. Their results are such as to encourage any man who is willing to give the work a fair trial. One Northern Indiana grower produced apples last year that were exhibited alongside of the fruit from Hood River, and those who saw the display con-

This Low Priced, Light Draft, Riding Harrow, Keeps Down Weeds In Orchards

The "Acme" is an orchard tool because it is a perfect weed exterminator and surface mulcher, and there are no lumps or air spaces left beneath or on the surface after it is used. It will prepare the soil so that it will conserve all the moisture to benefit the growing trees or vines. The No. 25 Special Orchard Tool has been endorsed by the best orchardists in this country, because it has features that

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John Deere Plow Co., Portland, Ore., Spokane, Wash.

cannot be had on any other style of harrow. The Acme produces the

Perfect Seed Bed

so much desired for general crops. Let us send you our combined catalog and booklet, "Preparation of the Soil"—free. This booklet has been written

by practical farmers and will mean a bigger profit. Ask your dealer about the "Acme." It is an all right tool.

DUANE H. NASH, Inc.,
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Millington, New Jersey

ACME

Cuts, Turns,
Crushes
Levels and
Smoothes
In One
Operation

tended that the Western fruit was in no way superior. In the matter of quality it is generally admitted that Indiana fruit can compete with the best that grows. A few people have realized that Indiana can produce fruit, but it has been a rather uphill job to convince the general farmers that they can again grow the apples of their childhood if they will but follow the advice of the expert. The past four years has seen more advancement in fruit growing in Indiana than did the generation that preceded it. A number of large companies have been organized to purchase apple land in the south part of the state, and some of these companies are already in operation. The farmer has been convinced, capital has been convinced and still the work is in its infancy. Enough has been done that we feel assured of Indiana as a fruit producing state; the future will depend not upon the soil, the climate or the freedom from pests, but upon the industry and judgment of the men back of the fruit growing movement.—Contributed.

Grey Beetle and the Remedy

Paul G. Kruger in North Yakima (Washington) Republic

CLOVER leaf beetle, or snout beetle, are separated into a number of families, which need not be particularly described. In giving a brief history of the beetle found at the Northern Pacific model orchard tracts it is well to state too much care cannot be taken to eradicate this pest. It works early in the morning, especially on warm days, crawling upon the young trees, attacking the bark, girdling the tree completely on the top, feeding upon the unopened buds and afterward attacking the leaves. A young orchard thus attacked looks sickly and stunted. The beetle is generally found at the base of the tree. By digging carefully you will find it sometimes adhering closely to lumps of dirt, at other times scattered about two or three inches below the surface of the ground near the tree. As many as forty or fifty, it is not unusual to find attacking a tree.

The beetle is about one-half inch long, dull brown in color, tending toward gray, indefinitely striped wing cover and a short, stout beak. In looking up authorities on this beetle, Eco-

nomic Entomology, by John B. Smith, Sc. D., says as regarding this family of beetles: "This insect hibernates in the larval stage and their injury becomes manifest quite early in the season, often threatening entire destruction." This statement is proven by the fact presented at the Northern Pacific model orchard tracts, whole blocks of trees having been attacked by it and the buds destroyed. Not only does the beetle attack the apple trees, but pears as well as cherries suffer alike. In this instance two-year-old trees are attacked. I am creditably informed that the beetle has already scattered to the adjoining orchard tracts as far as Grandview. I would advise every orchardist to look carefully over his young trees, and if you find signs as above indicated use measures at once to destroy them.

Remedy.—Stir the soil well around your trees, yet not sufficient to scatter the beetle, then use the following kerosene emulsion: Two gallons of the best kerosene, one pound of whale oil soap, one gallon of soft water. If you have no soft water add borax. Boil the

whale oil soap in water until thoroughly dissolved, add to this one-half gallon of lime-sulphur solution. Add this when your whale oil soap is boiling. Lime will become separated from the sulphur for a time, but keep stirring and boiling, and soon your lime will mix. Now add your kerosene and agitate violently with a spray pump, using at least sixty pounds pressure for ten minutes. Be sure you have no free oil floating on the surface. Reduce this mixture ten times with water when trees are yet in dormant condition. When tree is out in leaf reduce twenty times. Spray the entire tree, but make your fight on the base of the tree. Saturate the ground with the emulsion, using a pressure of at least 100 pounds.

J. F. LITTOOY

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Land, irrigation and orchard schemes examined for owners, buyers, bonding companies or advertising agencies—Orchard and land values estimated—Orchard soils examined—Directs orchard development—Land damage claims estimated—All business confidential.

MOUNTAIN HOME, IDAHO

Stanley-Smith Lumber Co.

WHOLESALE AND RETAIL

Lumber

LATH, SHINGLES, WOOD, Etc.

HOOD RIVER, OREGON

BEES IN ORCHARDS



Insure Pollination—
Increase the Yield and
Size of Fruit—Improve
the Color and Flavor

EVERY FRUIT GROWER SHOULD HAVE A COPY OF OUR

1912 Bee Supply Catalog

TELLS WHY Bees are profitable and necessary for pollinating. Also gives interesting special information that will make it easy for you to successfully handle Bees and produce Honey.

Bee Hives and Supplies

WE ARE WESTERN AGENTS for the A. I. ROOT CO., and carry the largest and most complete stock of Bee Supplies in the West. Ask for Catalog No. 203.



PORTLAND SEED CO., PORTLAND, OREGON

This will absolutely kill them out and not hurt the tree. Mr. Chase, manager of the Northern Pacific orchard tracts, is using the emulsion and is having success with the same, and as he is a determined man I am sure he will be able to clean out the beetles.

Over \$1,300 for 1911 Crop

While this was an off year for the apple trees in this section and the average fruit production was comparatively light, the records made by many orchards this season show that, where proper care is taken in the selection of fruit lands, the Yakima Valley always makes good. An instance of the kind is found in the sales to the J. M. Perry Company from the five-acre Nob Hill orchard of S. P. Fairbanks, whose returns this year from his place were \$1,337. While his orchard produced but 1,000 boxes of commercial apples, which was just about one-fourth of last year's production, he sold them for \$1,100, while twenty peach trees brought returns of seventy dollars, at an average of forty cents per box. The trees in the Fairbanks orchard are now thirteen years old. His total sales for the season were as follows: Apples, 1,000 boxes, \$1,100; cherries and apricots, \$125; prunes, \$17; pears, \$25; peaches, 175 boxes at 40 cents, \$70; total, \$1,337.

But this was not all the revenue that Mr. Fairbanks received from his five acres. Besides raising sufficient garden stuff to supply his own table, he raises chickens and pigs and keeps a cow, in fact practices intensive farming on a scientific plan, and in this, an off year, his net returns are greater than the average received by the farmers of the prairie states.—North Yakima Republic.

J. M. SCHMELTZER, Secretary
HOOD RIVER ABSTRACT COMPANY
 Hood River, Oregon
 ABSTRACTS INSURANCE
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VIRGINIA COMMERCIAL ORCHARD Unusual Investment

135 acres rich Porter's loam, 3,500 bearing trees 8 to 12 years old, apples and peaches, best varieties, big and thrifty; have had best attention since planting; bore very heavy crop 1910; fine prospects for large crop this year, estimated from \$10,000 to \$12,000. Positively one of the best fruit properties in Virginia. Full description and photos on request.

PRICE \$22,500

VENABLE & FORD, Lynchburg, Virginia

Miss Harker's School for Girls

PALO ALTO, CALIFORNIA

Accredited to College, Music, Arts and Crafts, Home Economics, Physical Training, Out of Door Life, Sleeping Porch. Number limited. Address

MISS HARKER, Palo Alto.

BETTER FRUIT

O. A. C. Student Appointments

Seniors and short course students from Oregon Agricultural College are at a premium to fill all sorts of positions, as is indicated by the announcement this week of a number of new appointments. Walter E. Morris, who came here four years ago from Pennsylvania, has just been made instructor in commercial branches in the Marshfield high school for next year. He is senior class orator this year and business manager of the new Commerce-Pharmacy quarterly, as well as a prominent debater and orator in the forensic work. F. H. Getchell, Corvallis, is an orchard inspector now for the Canadian government's Department of Agriculture, and James French, also Corvallis, is on the Allendale orchard tract of Hood River. Both were at the past two winter courses and have some regular work in the college. Howard Chapin, Medford, who was in this year's short course, has gone to take charge of the fruit ranch in Kings Valley owned by Mr. Howard of Aberdeen, North Dakota, succeeding Otto Elmer, 1911, Mulino, who returns to government service, continuing his pre-cooling investigations in the fruit districts of Oregon and Washington.

Editor Better Fruit:

I think "Better Fruit" is the best paper of the kind that I ever read and I always wish to remain a subscriber. Yours truly, H. G. Fitzimons, San Francisco.

Editor Better Fruit:

Enclosed find check for one dollar, for which please send me the "Better Fruit" for the coming year. I have taken "Better Fruit" now for a year and couldn't feel like a progressive fruitgrower without it. If more of our growers here would read the valuable articles which I have found in your journal I feel that we could see a wonderful change in our orchards. Yours truly, John J. Burroughs, Fruita, Colorado.

Editor Better Fruit:

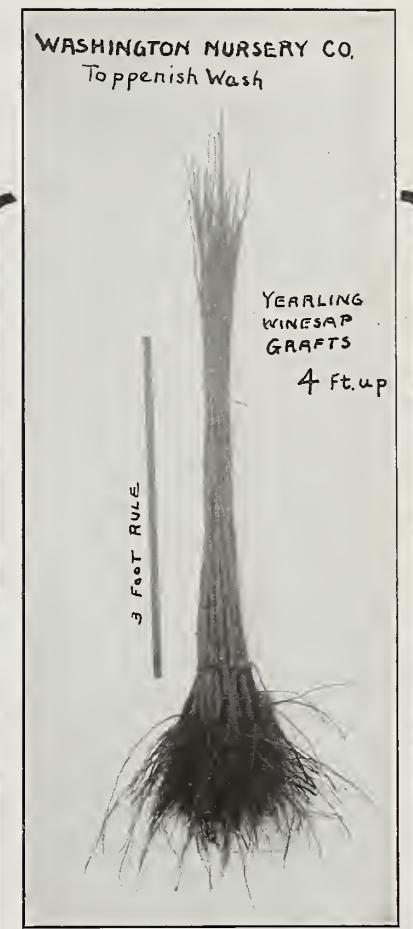
It may be of interest to you to know that our efforts to obtain the right kind of publicity for the Caterpillar tractor through advertising in your paper has been quite satisfactory. The use of a class paper such as yours for general publicity was to a certain extent with us an experiment. My experience inclines me to believe that not much results can be expected from the first two or three insertions of an advertisement exploiting anything new to a new class of readers. Direct results from our advertisement in "Better Fruit" began to appear last month. We sold, in less than a week's time after receiving the first letter, one of our 60-hp. Caterpillars for orchard work to the management of a large orchard in British Columbia, whose attention was first directed to the Caterpillar's use in orchards by our advertisement in "Better Fruit." During the last week we have a number of inquiries, all mentioning "Better Fruit." At the present time we have nearly a dozen Caterpillars working in orchards in the territory covered by "Better Fruit," and when we began our advertisement with you we had perhaps two. Yours very truly, J. W. Hill, Agent The Holt Manufacturing Company, Portland, Oregon.

*Messrs. Gilbert Vaughan Implement Co.
 Hood River, Oregon:*

Your advertisement in "Better Fruit" for July, 1911, page 99. Please send me a copy of descriptive and price catalogue of agricultural implements and garden and orchard tools. Yours faithfully, F. Welsh, Auditor Robilkhand & Kumam Railway, Barcilly, India.

Mr. Howe advises us that in the article appearing on page 26 of the March edition, at the bottom of the second column the sentence should read: "Sodium arsenite is used in the making of both products, but the difference lies in the form of lead used, which may be either acetate or nitrate, the former producing the neutral material, while the latter produces the acid."

WASHINGTON NURSERY CO.
 Toppenish Wash



WASHINGTON NURSERY COMPANY NEWS

May, 1911

We have finished a most successful season and are already selling heavily of all the staple fruits for delivery fall 1912 and spring 1913.

Not since the Washington Nursery Co. was started in the spring of 1903 have we made a more satisfactory sale, and recorded a larger number of well pleased customers.

That speaks well for our stock and our business methods. It's one thing to grow good trees and it's another to be equipped to place those trees in the hands of the customers in prime condition for planting.

This Year of 1912

We now have coming on a splendid plant of all the staple fruit, shade and ornamental stock. We never saw a better showing in our plant at this time of year.

Our large force of field salesmen is already out booking orders for the coming season, and from the way orders are coming in this will be a banner year.

The wise customer places his order early. If you're a prospective buyer we'll be glad to hear from you with a list of your wants. Our stock is grown under the best possible conditions, on clean new soil, and is not pest or disease infected. It is fully matured before digging and has the wonderful root system which can only be produced by rich soil, moisture judiciously applied and persistent cultivation.

All our apple, peach, pear, cherry, plum, prune, etc., are grafted and budded on our own home grown roots, which means that the trees are free from aphids, so common on stock propagated on outside seedlings.

NURSERYMEN

We have 120 acres of apple seedlings coming on for next season. They are now showing an almost perfect stand. Write us your wants. Orders already being booked for fall delivery.

Washington Nursery Co.
 Toppenish, Washington

More salesmen wanted for some good unoccupied fields.

They Tell The Story

On the Opposite Page

you will find just a few of the volleys used in the big Eastern advertising campaign just completed by *SUNSET, the Pacific Monthly*. These advertisements ran in the Saturday Evening Post, Associated Sunday Magazine, Monthly Magazine Section, The American Monthly Magazines, Harper's, Scribner's, Outing, National Magazine, etc., at a cost of over \$35,000.00.

The Sole Purpose

was to get acquainted with some of the countless thousands of people east of the Rockies and to tell them of this wonderland of ours on the Pacific Slope. As a result we are telling over 45,000 new friends all about the Pacific Coast country and will keep on telling them until we bring them west as travelers or as home-seekers.

Are You the Sort

of man or woman who really and truly wants to boost and do your share towards building up the country you live in? If so, here's the opportunity. Just fill out the coupon on the corner of this page and send it with a \$1.00 bill, check or money order for a six months' subscription to *Sunset, the Pacific Monthly* for yourself and another six months' subscription for a friend in the East.

Sunset Magazine Information Bureau, San Francisco, California
Gentlemen: Certainly I appreciate the boosting you are doing for
the Pacific Coast country. I want to get acquainted and I want
to help, so you will find, I want to get acquainted and I want
special offer. Send SUNSET, the Pacific Monthly for
six months to and

Continued from page 37

Let him go on from that to a few ewes, a cow or two. Let him have his garden patch and his wild flower bed. All these things that lead the child to love to do things, to love to plant seeds and watch things grow, to feed young animals and watch them develop; all these lead the child near to the heart of the universe, close to God, and they fasten him to the soil, if that is to be desired. My own boys, as soon as they are able, go to the hayfield and earn the same wages that we pay the men, they buy their own clothing, they spend a part of their money "foolishly" if they desire, and children always desire.

There is one reform in the country home that is needed; it is coming fast today in some sections of the country. I hope it will soon come everywhere—that is, the habit of ending the day's labor on as many days as possible early enough so that the men folks of the family can come home, get under the shower bath, put on clean clothes and have an hour or two of the evening to spend in enjoyment with the wife and mother and such friends as may be available. Living should be included in the program of every-day life on the farm so far as possible. True, there come days of such strenuous endeavor that only rest is possible at their close. Hay and grain must be harvested, emergencies arise. Ordinarily the work can be planned so that the farmer and his sons can come home in ample time to clean up, shave, slip on clean clothes, straighten up, smile, tell the wife that she is loved, take the family for a drive in the old family carriage or the new and shiny automobile. Life consists of living. Living is when one is loving—loving the world about him, the humankind about him, loving wife and child, grass and flowers, tree and sun and stars. Count that day lost when you have not lived, when you have not loved. Living is only possible when one ceases toil before exhaustion comes, when he allows himself strength enough for his chiefest duty, to be his best self with those he loves best. Loving is largely a matter of physical condition. The overworked, dragged-out man or woman has not left enough vitality to love much. Crimes are committed in the name of "duty," when men and women toil over-long, leaving not sufficient strength to meet their dear ones in their best estate. Do not imagine that you are doing your duty to your family when you overwork—come in "tired out," depressed, maybe morose. No amount of money earned and left your family will compensate for the loss of that best self that was crushed out of you and that should have been steadily theirs. The farmer should learn to leave his cares and worries with his old boots and coat, somewhere in a back closet, when he comes into the home after the day's work is done. That is simple justice to the family and only good sense from any standpoint. There is nothing gained by carrying with one continually the worries and stresses of busi-

ness and labor. Men who accomplish most learn the use of that word "recreation." Take that word apart, it means to create again, to build again the brain tissue and body tissue of the worker. Men who leave their cares in the field, who refuse to dwell endlessly on their troubles and perplexities are men who see the clear vision that ends in overcoming the troubles and perplexities. In justice to yourself and to the wife and children learn to shake off your cares with your old soiled clothes in evening time, to come with some sort of a smile, even if it is not a very wide one at the outset, into the midst of your family circle. In overwork women are the chief sinners. With less endurance than men they are given the part of the work that is least invigorating and most wearying, the part that is "never done." Servants are not to be had in country homes today. The housewife must do her own work almost altogether. How can she cease each day her toil before her strength is gone?

The problem seems difficult, yet some things can be done, in fact much can be done to solve it. The worst difficulty is the innate conservatism of womankind in her dislike of changing her ways. She has a sensitive and often badly taught conscience. She burdens herself with duties that might as well be left undone. Not content with giving her family necessities, she thinks it her duty to add luxuries as well. I make the following suggestion to American country women for lessening their toil: Simplify the morning meal. Adopt the European breakfast more or less completely. With children, oatmeal with cream, dry, hard toast, butter and milk. That is menu enough. For the father add a bit of bacon if he is working hard, and coffee if he is a coffee drinker. In season serve fruits, uncooked. Such a simple breakfast will send the family out with clear heads and light hearts and good digestion, and there will be few dishes to wash afterward. The heavy American breakfast is a sin against hygiene—undermining digestion, sapping the efficiency of men and women and unnecessarily burdening womankind. If the American housewife could so simplify her breakfasts it would add immensely to her life and happiness, and once the men folks got used to it they would be astonished to see how much better off they, too, were for the simple morning meal. The noonday meal also can be greatly simplified. Less variety should be given, fewer dishes, changed from day to day, and these few as good as one pleases. With the simplified breakfast a good evening meal goes well. Digestion goes on best when rest comes at the close of the day. I see no reason why the men folks should not help the housewife finish her tasks in the evening. Boys can be trained to make their own beds and keep their own rooms in order.

A woman may be one of two things. She may be a tired, faded, depressed, anxious, sorrowful being—that may come from simple overwork, from too

much household drudgery—or she may be erect, unwearied, smiling, happy, making everyone who sees her happy. It is difficult for the worn out woman to love anyone; it is difficult for anyone to love the worn out woman. It is not true that you are loved for what you have done. You are loved for what you are. This is one of the saddest disappointments in life. The man or the woman toils unceasingly till wearied, worn, haggard, near done. Then comes the bitter knowledge that they are not loved the more for the sacrifices they have made. To get the most love make yourself the most lovely. That means to conserve strength, to keep a part of your energy for just living, to be in such trim that you feel through and through you the joy of life. That is a more sacred duty than keeping a house immaculate; a more sacred duty than to add acre to acre or to pile up a bank account. Americans, least of all people, understand this truth. The women of South America are unhurried, unworried, worshiped by the husbands and children. Are their homes as well kept as ours? I will not say it does not matter whether they are or not. They have chosen the better part, to keep the gardens of their own lives. We come, then, back to the central thing in the American home—a woman, a shelter and a fireside. These three, when love is there, make the home, and the chiefest of the three is the woman. You can build or rebuild or repair the house to suit your desires. The fire can be replenished and rebuilt. The American woman is the best gift of God to man. Let us learn to conserve her, develop her best possibilities and enjoy her to the utmost.

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Trainloads of Reo the Fifth

In the past 25 years a dozen models of mine have become the season's sensation.

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But Reo the Fifth has broken all records. I never saw a demand which compares with this.

Five cities at this writing have trainload orders with us—orders for forty carloads each—to go in a single shipment.

But the demand is just beginning. Very few men have yet discovered this car.

Soon there will be 10,000 cars in the hands of 10,000 owners. Ten thousand men will be telling others how Reo the Fifth performs.

Then will develop the real demand for this final car of mine.

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Other season's sensations have come and gone. New cars and better came out to displace them.

Those days are over now. Reo the Fifth comes close to the limit in motor car engineering. It embodies the final results of my 25 years of experience. In every detail it marks the best I know.

There is no probability that we shall ever see a materially better car. The years can bring only minor changes.

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This car deserves popularity. That is my satisfaction.

The men who buy it get the utmost of which I am capable. There will be no regrets—none to say I misled him. And none will ever see a car which gives more for the money.

Every part of the car shows the final touch—the avoidance of petty economies. I am proud of it. Not an iota has been omitted which could add to the worth of this car.

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Then here, for the first time, we get rid of all side levers. All the gear shifting is done with this center cane handle—done by the right hand. It is done by moving this lever less than three inches in each of four directions.

Both brakes are operated by foot pedals, one of which also operates the clutch. So the entrance in front, on either side, is clear.

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Thus we have solved the last important problems in designing.

Price Still \$1,055

The price of this car remains at \$1,055, though subject to instant advance. This price is too low for a car like this. It leaves no adequate margin.

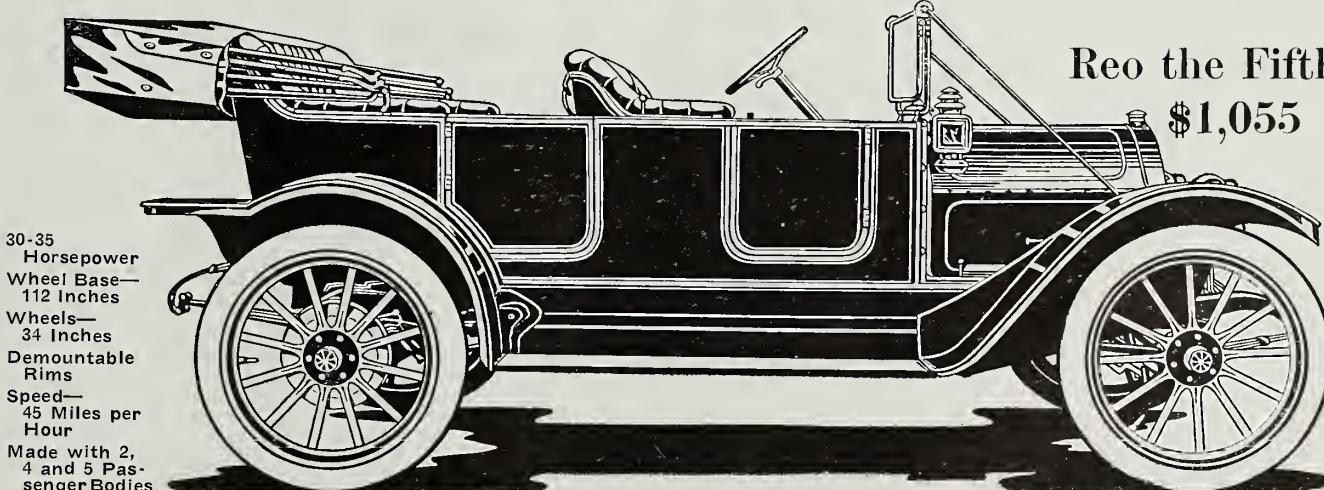
But we shall continue this price, in all probability, until materials on hand are exhausted.

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Wheels—34 Inches
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Nicotine Sulphate.

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Valuable Suggestions for Orchardists

Report of Horticultural Commissioner Volek, Santa Cruz County, California

DURING February and March the incoming nursery stock has totaled as follows: Mixed trees (small shipments and varieties such as citrus trees, nuts and others in small numbers), 2,599; apple, 15,295; pear, 6,897; peach, 1,895; plum and prune, 1,448; apricot, 4,047; cherry, 526; total, 32,707. Apple seedlings, 32,600; berry plants, currants, etc. (estimated), 34,200; grapes, 1,750; ornamental (estimated), 164. For the entire season these totals are: Mixed trees, 3,639; apple, 37,966; pear, 12,780; peach and nectarine, 5,428; plum and prune, 3,070; apricot, 9,670; cherry, 1,724; total, 74,277. Apple seedlings, 142,700; berry plants, 50,000; grapes, 2,160; ornamental, 300. The inside grown stock totaled 97,818 trees, of which 92,548 were apples. This, then, makes a total of 152,095 trees planted in the Pajaro Valley and other parts of Santa Cruz County, or an estimated new acreage of 2,500. The character of this nursery stock is a considerable improvement over that of last year, and there has been correspondingly fewer rejections. The total rejections of inside grown stock for February and March was 260 trees and outside stock 350 trees, making a total of 610, and the total for the season is about 800.

There probably never was a better general outlook for a heavy apple crop than exists at the present time. All varieties are blooming abundantly and the fruit buds appear strong and vigorous. Pears are in the same promising condition and apricots have set a

medium to full crop according to the condition of the trees. Cherries are blooming well and there is every prospect of a good crop if the present favorable weather conditions continue. A number of orchards will be ready for the first arsenical and mildew spraying by the tenth of April. This first spraying should be applied when two-thirds of the blossoms have fallen. The object of this spraying is to kill canker worms, tussock and other caterpillars before they have had time to damage the young fruit, and also to develop sulphur immunity in the trees where the mildew treatment is to be applied. These objects, together with the control of apple aphids, are best accomplished by a mixture of zinc arsenic, iron sulphide and "Black Leaf 40." Formula: Zinc arsenite (dry basis), 6 pounds; iron sulphide, 6 pounds; "Black Leaf 40," 1 pound; water, 200 gallons. Mix the zinc arsenite and iron sulphide into the water and add the nicotine last. Apply thoroughly and with constant agitation. This first application should be followed in about ten days with a second spraying, using the same formula in order to make the killing of caterpillars more thorough, and continue the mildew treatment. A third spraying two weeks after the second should be made with twelve pounds of neutral arsenate of lead, substituted for the zinc arsenite. These three sprayings will insure good control of caterpillars and codling moth and a moderate control of the mildew. For more thorough control of this disease two other sprayings should be applied at intervals of two weeks, counting from the time of the third spraying. For mildew on Gravensteins the strong iron sulphide formula (20 pounds to 200 gallons) has proven very satisfactory, and it is recommended for this variety.

Pear scab is always present and requires regular treatment with bordeaux mixture. Apples in the valley seldom require this treatment, but there are localities in the hills where the apple scab is quite as persistent as the disease on pears. The bordeaux

treatment is not advised for apples except where necessary, and the experience of the grower should indicate whether this treatment is advisable. Bordeaux mixture should not be mixed with zinc arsenite, iron sulphide or "Black Leaf 40" because of danger of

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C. R. Paddock, Manager

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Plums, Prunes, Apricots, Grapes
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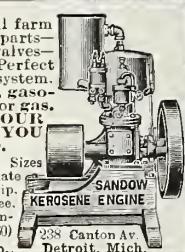
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injury from these combinations. Formula: Copper sulphate (bluestone), 20 pounds; lime (best quick lime), 25 pounds; acid arsenate of lead, 16 pounds; water, 200 gallons. Dissolve the bluestone and slake the lime in separate quantities of water, fill the spray tank about two-thirds with water, add the milk of lime and start the agitator. Now add the bluestone solution, and last of all the arsenate of lead. To insure good results on pears the first spraying should be applied just before the first blossoms open, a second when most of the petals have fallen and a third some three weeks later. Apples are well handled by spraying in full bloom and followed by an application ten days to two weeks later.

Zinc arsenite is a very strong poison and may cause foliage injury if not properly handled. When mixed with iron sulphide the foliage injuring properties are largely restrained, and several applications may be made. When no iron sulphide is used only the first (full bloom) spraying should be applied with this arsenical. In all subsequent sprayings it is best to use neutral arsenate of lead. The rainfall has been considerably less than normal, but there is enough water in the soil to insure a good fruit crop if properly conserved. Under average conditions a very superficial system of cultivation is sufficient in this county, but this year the work should be done more thoroughly, especially with regard to producing a fine surface mulch. Apparently this spring

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No more carriages were sold in 1910-11 than in the previous season. Yet the sales of Goodyear "Wing" Carriage Tires increased 24% in that same period. And for 1911-12 we estimate an increase of 81% over 1910-11.

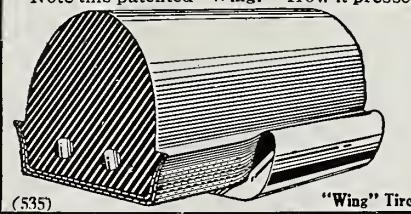
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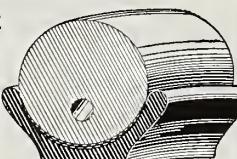
Our "Eccentric" Cushion Tire

is especially designed for lighter vehicles — runabouts, etc. Note the wire hole is below the center. This increases wearing depth of the tire one-half. Saves you that much money. Stays firm in the channel. The high-grade, resilient rubber used makes this tire remarkably easy-riding. Always gives satisfaction.

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BRANCHES AND AGENCIES IN 103 PRINCIPAL CITIES



"Eccentric" Cushion Tire

and summer cultivation should not be deep, but harrowing and dragging to produce a compact dusty surface accomplishes the best results. It is quite conservative to say that the amount of such harrowing and dragging should be doubled this year as compared with that of former seasons.—Exchange.

Top-Working Fruit Trees

By W. H. Wicks, Horticulturist, Idaho Experiment Station

SOME operators remove the entire top the first year and insert scions in all stubs which are favorably located and furnish young wood in which to work. This has proven a bad practice in the Pacific Northwest where trees grow rapidly. The sap which has been sent to the large leaf surface for being worked into various elements by the leaves will collect at the end of each stub to such an extent that fermentation takes place, which prevents the cambium layer of the scion from uniting with the cambium layer of the stalk. This condition is commonly spoken of as "flooding the scion." This is especially true on trees ranging from three or four years of age and upward. The first aim of the top-worker in choosing stubs should be a desirable distribution of them, which will form a balanced and shapely tree when the scions have grown. He should bear in mind the future tree. The limbs which are poorly distributed and not satisfactory for grafting upon should be left, at least during the first growing season, to take care of the surplus sap in order to prevent flooding of the scion. The number of stubs to leave will vary according to the variety, and must be determined by the men who are doing the work. A good general plan is to retain from three to five scaffold limbs when the work is being done on very young trees, or to cut

away only enough limbs to set scions for a good top on older trees. Future pruning and training of the tree will take care of the limbs which are left. Judgment must be used in regard to the time the work is done and the amount of wood taken out each year. The working of too many stubs results in a dense top, which means more work for the pruner in future years. In our semi-arid districts where the sunlight is intense one must figure on leaving enough limbs and foliage to protect the stubs and trunk from sun scald. The protection that the remaining limbs afford the scions from wind, sun and mechanical injuries, such as passing teams and machinery, should be considered. We naturally conclude, then, that the inside limbs are best protected and make desirable limbs for grafting. One must be careful not to form a head too close in his endeavor to secure inside stubs. A large percentage of top-worked trees have a tendency to grow upright, and must be watched carefully by the pruner each year in order to correct this. By leaving a scattering lot of limbs, for reasons mentioned above, one sometimes finds them very useful for working the second year in case the first year's work has not been entirely satisfactory or some of the scions meet with accident. If the tree to be top-worked does not possess limbs young and small enough

for working they can be severely cut back, which will bring forth a great wealth of young growth. This growth can be worked with very satisfactorily. Only in rare cases is it advisable to work in this manner.

In most all orchard operations it is necessary to have some ideal or goal for which to work. It is very discouraging, indeed, to carefully select the stubs and do the grafting and get nothing for our labor but failure and disappointment. The writer has seen many nice trees carefully top-worked in all respects except the ideal time. One must study the condition of his trees in early spring, and do the work about the time the sap is moving and the buds are beginning to swell. This date cannot be determined by the calendar. While earlier setting of the scion may be practiced there is always danger of it drying before the cambium layers become united. It is better to begin late than too early.

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Yakima Valley Fruit Men Elect Officers

From North Yakima (Washington) Herald

THE annual meeting of the directors of the Yakima Valley Fruit Growers' Association, held on Tuesday, January 23, in the office of the organization in the Miller Building, was attended by the representatives from the entire fifteen districts composing the main body. The election of officers, held at the evening session, resulted as follows: President, M. E. Olsen; vice-president, George E. C. Jackson; secretary, P. D. Spencer; treasurer, E. M. Sly; executive committee, M. E. Olsen, J. E. Shannon, B. D. Thompson, E. M. Sly and C. H. Stein. J. H. Robbins was re-elected as general manager.

Taking all things into consideration the season of 1911 may be said to have been very successful. There were a number of handicaps encountered, including the frosts of spring, which cut down the number of cars handled by the association, but in spite of all drawbacks success in no small degree was attained. Reports of the business of the year and suggestions for the future were read by Secretary W. P. Romans, Traffic Manager J. T. Ronan and Auditor P. D. Spencer. The Yakima Valley Fruit Growers' Association is a very important factor to the orchardists of the Yakima Valley, and it is a subject of pleasure to the management that they are taking such a deep interest

in it. The voluminous report of General Manager Robbins covers the ground in detail, and it will make interesting reading, as it is found herewith in full:

The association handled during the year ending December 31, 1911, 1,600 consignments, of which 311 were carload shipments, the balance being less than carload and express shipments. Carload shipments appear in detail on schedule "A" of the auditor's report.

The apple returns, per our figures published in comparison with the results of the Wenatchee pool, are now a matter of history and demonstrated conclusively the efficiency of our marketing machinery. In connection with the apple question, a few additional statistics will not be amiss. Excluding shipments from the Touchet Valley the straight carloads of all varieties, grades and sizes gave an average realized price of \$1.25 as follows, as shown in detail as to grade, kinds and sizes on schedule "D" of the auditor's report:

Variety	Per Box
Spitzenberg	\$1.52
Stayman	1.43
Jonathan	1.13
Arkansas Black	1.33
Grimes Golden	.94
Rome Beauty	1.20
Gano	1.10
Winter Banana	2.04
White Winter Pearmain	1.32
Delaware Red	1.15

Black Twig	1.16
York Imperial	1.18
Black Ben	1.15
Yellow Newtown	1.47
Ben Davis	1.03
Missouri Pippin	1.11
Wagener	.91
Red Check Pippin	1.11
Winesap	1.46
Various	1.05

Including the shipments from the Touchet Valley, at an average price per box of \$1.16, all straight carloads, gave an average realized price of \$1.22. A few mixed cars and less than carload shipments not included in the above. Of the apples shipped the different varieties showed the following percentage in each size shipped:

	3½ Tier	4 Tier	4½ Tier	5 Tier
Spitzenberg	9	59	26	6
Stayman	25	57	15	3
Jonathan	2	43	38	16
Arkansas Black	12	54	30	5
Grimes Golden	4	19	10	66
Gano	24	64	7	4
Winter Banana	16	58	23	.
Rome Beauty	26	48	23	2
White Wintr Pearmain	3	52	40	4
Delaware Red	61	56	35	.
Black Twig	18	49	40	6
York Imperial	12	48	28	1
Black Ben	75	25	..	.
Yellow Newtown	5	48	40	13
Ben Davis	17	54	23	5
Missouri Pippin	12	32	35	22
Wagener	5	79	40	.
Red Check Pippin	12	55	30	3
Winesap	2	38	31	28
Various	5	27	58	10
Average	12	45	30	13

Of the apples shipped the different varieties showed the following percentage in each grade shipped:

Variety	Extra Fancy	Fancy	Choice
Spitzenberg	35	30	35
Stayman	50	35	15
Jonathan	34	40	26
Arkansas Black	15	67	18
Grimes Golden	7	10	83
Rome Beauty	31	45	21
Gano	5	50	45
Winter Banana	60	25	15
White Winter Pearmain	60	33	7
Delaware Red	37	39	21
Black Twig	40	40	20
York Imperial	33	39	28
Black Ben	..	100	.
Yellow Newtown	64	6	30
Ben Davis	26	16	58
Missouri Pippin	23	39	38
Wagener	3	83	14
Red Check Pippin	16	20	64
Winesap	60	25	15
Various	15	30	55
Average	37	37	26

The secretary, to whom your board assigned the additional duties of field superintendent, includes in his report a detailed statement covering memberships, collateral notes, acreage, membership certificates, together with a statement each of trustee and executive committee meetings and those in attendance at each meeting, together with a report of his field work, use of the association's automobile, cost of operation, miles traveled, etc.

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A Wealthy Agricultural and Fruit Section

By A. R. Kanaga, San Francisco, California

HAVE been here in Fresno County, California for the past week looking over one of the five richest agricultural counties in the United States. Between 1900 and 1908 it stood second on the list, but since the latter date it has passed to the front and is now historical as the richest agricultural county on the American continent. It has a gross income of forty-five million dollars per year, which is a greater sum from agricultural and fruit products than that obtained in some of the New England states. For fifteen years past this county has supplied one-third of the world with its raisins. Its only competitor is the monarchy of Spain, but Fresno County yields annually a fraction more than that entire nation. The dairy products are the next largest interests here, and they alone will surpass the entire income of hundreds of counties in the East and Middle West. Other important products in this world beating county are olives, figs, peaches, apricots, melons and vegetables. Oranges and lemons of superior quality are produced in portions of the county and is an important factor of wealth to these people. Fresno County has about 100,000 acres planted to grapes of various kinds, besides large acreage to the other fruits mentioned above. These practically cover all available fruit lands except as new irrigation projects

are developed and additional lands are brought under water. In many localities water is available for pumping for irrigation, but it has not been done extensively in this county. Just think of being whirled through a land of vineyards, a vast prairie of clinging vines, every acre worth from \$500 to \$1,000, our automobile going at twenty miles an hour, and never twice over the same road, yet from early morning to night, under a cloudless sky, the air as balmy as the South of France, I did not see one-third of those beautiful vineyards. I have seen the vineyards of Europe, and nearly everything worth seeing in a horticultural line in America, and never before did I see so vast an empire of vineyards and orchards, with beautiful homes and other evidences of prosperity apparent on every hand.

The principal alfalfa sections lie to the west and south of the City of Fresno. The acreage is about equal to that in fruit, and is a constant and reliable source of income. Alfalfa is everywhere recognized as the king of forage plants, and that is particularly true here where stock graze on it almost the year around. As alfalfa is practically a perfectly balanced ration for dairy cows no expensive mill feeds are used. Few dairymen here ever stable their cows, and with almost no hand feeding the conditions are as nearly ideal as

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Have for the coming season a very complete line of
Nursery Stock

Newtown and Spitzenberg propagated from selected bearing trees. Make no mistake, but start your orchard right. Plant generation trees. Hood River (Clark Seedling) strawberry plants in quantities to suit

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SOIL Rich black gravelly loam with clay subsoil, very productive with irrigation.

WATER Abundance of fine water over which there never can be litigation.

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can be found. In the extreme western part of the county is the largest body of rich undeveloped arid land in America. This is level as a floor and rich as the Valley of the Nile—apparently ideal alfalfa soil and conditions with the addition of water. Bringing this 600,000 acres under irrigation is a task so stupendous that only the Government Reclamation Service can undertake it, and this they must surely do within a short time. When this great body of land is reclaimed by irrigation Fresno County will be so vast and rich in production that not a spot on earth of equal size can rival it in agricultural wealth and importance.

One thing that has retarded the development of this section, along with many other portions of California, has been the presence of the old-time ranchers whose holdings run from 1,000 to 10,000 acres, and who would neither sell at a reasonable figure nor develop his land along modern, up-to-date methods. Gradually, however, these old land barons have been dying off and their more progressive heirs are either selling off their lands in a body or cutting it up into smaller farms. Well informed men tell me

Pure Maple Syrup

The real old-fashioned article, made from the sap of the Rock Maple in my own sugarbush. Have only a few hundred gallons.

BUCKWHEAT FOR BREAKFAST

One gallon by prepaid express upon receipt of \$4. Rates for 10 gallons or over by freight.

P. H. BLOSSOM, Birmingham, Ohio

that during the last seven years big land men of the state have let go of more than two million acres, and that one-half of this has already been sold and developed into small and productive ranches. I dwell upon this subject at some length for the reason that these ducal estates, held by a few rich men, have done more to retard the development of the West during the past forty years than all other causes combined. One of these immense ranches, containing 10,000 acres, adjacent to the City of Fresno is now being put under ditch preparatory to cutting up into small farms. Today I rode over a new boulevard, one hundred and twenty feet wide and to be bordered by trees its entire length, which extends from the city to the San Joaquin River, ten miles away, and which passes through this new tract, a level ocean of land on either side. A county that yields so much of treasure and beauty as does this one will not allow this new irrigated tract to lay very long without being settled up, and in a short time from now the person who rides over this stately highway will see hundreds of homes and orchards, and will pass churches and schools where today I could only see a few scattered homes. I am indebted to Newton Carnine of Fresno for my view of this land and other parts of the county. He is one of the public spirited men who has been instrumental in bringing about this new order of things in the state by inducing some of the great landholders to let go of their property for the purpose of making homes for the common people.

It is worthy of note in passing that among the extensive landholders of the state there have been some notable exceptions to those who have held on to their holdings regardless of the best interests of the people and the development of the state. In this class was the lamented Senator Stanford, founder of the university which bears his name. Through fear of bringing injury to the people whom he loved, and who in turn loved and trusted him, he years ago cut up his valuable estate into homes for the small rancher. Various agencies are at work to imbue other large landholders with this spirit with more or less success. The most useful man in all this Western country is he who can bring about the opening of these rich lands to settlement, for when it is all said the most valuable asset of any country is just plain people, living on the soil.

[Mr. Kanaga has visited in person every irrigation project, both government work and private projects under the Carey act, in the Western States and is conversant with irrigation in all its forms and conditions. Mr. Kanaga is a newspaper and magazine writer of great note, his matter finding a ready outlet in all of the big papers of the East and South. He will no doubt write some interesting articles about the Yuma project as soon as he has familiarized himself with the conditions and made a study of the progress made on the work.—Ed.]

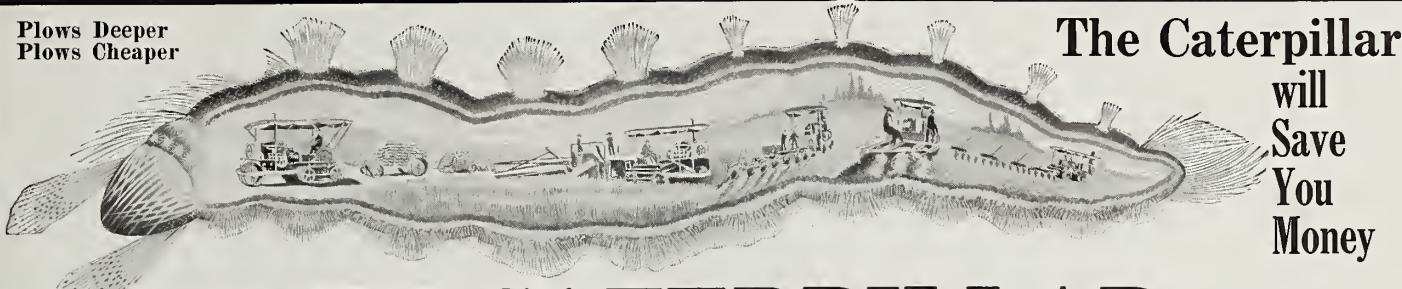
OUR UNPARALLELED CLUBBING OFFER

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The Ladies' World.....\$.50	Everybody's\$1.50	Country Life in America,\$4.00
Modern Priscilla75	American Magazine1.50	World's Work3.00
"Better Fruit" .....1.00	Delineator .....1.50	Everybody's .....1.50
Total .....\$2.25	"Better Fruit" .....1.00	Delineator .....1.50
All for .....1.85	Total .....\$5.50	"Better Fruit" .....1.00
—	All for .....3.90	Total .....\$11.00
—	—	All for .....7.75
Garden Magazine .....\$1.50	Housekeeper .....\$1.50	Kansas City Weekly Star,\$.25
American Magazine .....1.50	Review of Reviews.....3.00	"Better Fruit" .....1.00
"Better Fruit" .....1.00	McClure's .....1.50	Total .....\$1.25
Total .....\$4.00	"Better Fruit" .....1.00	Both for .....1.00
All for .....2.90	Total .....\$7.00	—
—	All for .....4.50	—
Delineator .....\$1.50	—	Woman's Home Com-
Good Housekeeping .....1.50	Country Life in America,\$4.00	panion .....\$1.50
"Better Fruit" .....1.00	Review of Reviews.....3.00	"Better Fruit" .....1.00
Total .....\$4.00	McClure's .....1.50	Total .....\$2.50
All for .....2.75	"Better Fruit" .....1.00	Both for .....1.80
—	Total .....\$9.50	—
Scientific American .....\$3.00	All for .....6.75	Woman's Home Com-
"Better Fruit" .....1.00	—	panion .....\$1.50
Total .....\$4.00	Country Life in America,\$4.00	"Better Fruit" .....1.00
Both for .....3.50	Outing .....3.00	Total .....\$4.00
—	"Better Fruit" .....1.00	All for .....3.00
Fruit Grower (St. Joe) ..\$1.00	Total .....\$8.00	Weekly Oregonian .....\$1.50
"Better Fruit" .....1.00	All for .....6.25	"Better Fruit" .....1.00
Total .....\$2.00	—	Total .....\$2.50
Both for .....1.50	Review of Reviews.....\$3.00	Both for .....1.75
—	Woman's Home Com-	—
The Ladies' World.....\$.50	panion .....1.50	Everybody's .....\$1.50
Pictorial Review .....1.00	McClure's .....1.50	St. Nicholas .....3.00
Modern Priscilla .....75	"Better Fruit" .....1.00	"Better Fruit" .....1.00
"Better Fruit" .....1.00	Total .....\$7.00	Total .....\$5.50
Total .....\$3.25	All for .....4.50	All for .....4.50
All for .....2.15	—	—
—	Sunset, Pacific Monthly,\$1.50	Breeders' Gazette .....\$1.75
Good Housekeeping .....\$1.50	"Better Fruit" .....1.00	"Better Fruit" .....1.00
Cosmopolitan .....1.50	Total .....\$2.50	Total .....\$2.75
World Today .....3.00	Both for .....1.90	Both for .....2.00
"Better Fruit" .....1.00	—	—
Total .....\$7.00	Suecess and National	Northwest Poultry Jour-
All for .....3.70	Post .....\$1.00	nal .....\$ .50
—	American Magazine .....1.50	"Better Fruit" .....1.00
Review of Reviews.....\$3.00	"Better Fruit" .....1.00	Total .....\$1.50
McClure's .....1.50	Total .....\$3.50	Both for .....1.25
Scribner's .....3.00	All for .....2.70	—
"Better Fruit" .....1.00	—	World's Work .....\$3.00
Total .....\$8.50	Delineator .....\$1.50	Everybody's .....1.50
All for .....6.15	Suecess and National	Delineator .....1.50
—	Post .....1.00	"Better Fruit" .....1.00
The Etude .....\$1.50	Everybody's .....1.50	Total .....\$7.00
"Better Fruit" .....1.00	"Better Fruit" .....1.00	All for .....4.50
Total .....\$2.50	Total .....\$5.00	—
Both for .....2.00	All for .....3.60	Garden Magazine .....\$1.50
—	—	"Better Fruit" .....1.00
Good Housekeeping .....\$1.50	Suecess and National	Total .....\$2.50
Post .....1.00	Post .....1.00	Both for .....1.90
American Bee Journal...\$1.00	American .....1.50	—
"Better Fruit" .....1.00	Cosmopolitan .....1.50	Good Housekeeping .....\$1.50
Total .....\$2.00	"Better Fruit" .....1.00	Pictorial Review .....1.00
Both for .....1.65	Total .....\$6.50	"Better Fruit" .....1.00
—	All for .....4.40	Total .....\$3.50
Review of Reviews.....\$3.00	Century .....\$4.00	All for .....2.50
Scribner's .....3.00	Everybody's .....1.50	Semi-Weekly (Oregon)
Good Housekeeping .....1.50	World's Work .....3.00	Journal .....\$1.50
"Better Fruit"1.00	"Better Fruit"1.00	"Better Fruit"1.00
Total\$8.50	Total\$9.50	Total\$2.50
All for6.00	All for6.60	Both for1.75

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Ready for work when work is ready. Expense stops when work stops. Will plow ever day, rain or shine. Ground never too hard nor too soft. No wheels to slip. Turns in its own length. Does not pack the soil. Repeat orders our best endorsement.

Following is a partial list of orchardists who are satisfied users of the Caterpillar:

Lewiston Land & Water Co.....Lewiston, Idaho
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Fargo Orchard Co.....Portland, Oregon
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Full information and literature, with new attractive price, on application to nearest Branch House.

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60-h.p. Caterpillar Working in Plowed Ground, Fargo Orchards,
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Annual Meeting Hood River Apple Growers' Union

From Hood River (Oregon) Glacier

AFTER the most hotly contested election in the history of the Apple Growers' Union the progressives carried their straight ticket by a large vote Saturday. The meeting was characterized by the close alignment shown by the members for the two factions, that supporting the policies of the old board of directors and those favorable to a change in policy, and the warm speeches by the leaders of the two sides. The newly elected board is composed of L. E. Clark, O. L. Walters, W. B. Dickerson, Albert Sutton, Dr. Stanton Allen, F. G. Hutchinson, C. W. Hooker, L. E. Ireland and John Mohr. The ticket of the men supporting the old board was made up of G. A. McCurdy, V. Winchell, Oscar Vanderbilt, A. D. Ramsey, C. R. Bone, C. C. Carpenter, J. J. Gibbons, J. R. Shelton and C. Dethman.

The first matter of interest that came before the meeting of growers, which, with the exception of the mass meeting held in February to consider the proposed "Rogue River plan," was the

largest ever convened here, was the report of Manager C. H. Sproat. The report was long and went very much into detail as to what the union did last season and with suggestion for the coming year. The most salient parts are given in the extracts following: "The volume of business for the season of 1911 was very much less than that of the season of 1910, owing entirely to the very much shorter crop for the season of 1911 as compared with that of the preceding year. The total number of crates of strawberries handled this last season was 23,000, cherries 726 boxes, peaches 559 boxes, pears 7,980 boxes, apples 129,315 boxes. The total number of packages of fruit handled in 1910 was 420,000. We do not look upon the growing of cherries and peaches in Hood River as a business of commercial importance. First, we have no carload lots of these varieties of fruit, and consequently all business has to be done within express distance shipments, and therefore we have no regular market for this class of fruit,

but have to catch them haphazard as we can in our own immediate vicinity, and our local markets are generally flooded with this kind of fruit from other sections, and consequently our growers of these varieties are working at a very great disadvantage. Fortunately these crops are not getting very much consideration from our growers, and we think they realize that they are not in a class with the growers of the same varieties of fruit grown in other sections in carload lots. Relative to pears, the production is gradually increasing. The last season was not a very favorable one in general for pears, as the production of pears everywhere last season was very large. However, we were able to net our growers \$1.15 for Bartlett pears, \$1.79 for d'Anjous, \$1.17 for Winter Nelis and 76 cents for small Bartletts. Relative to apples, we have listed with us seventy-six different varieties of apples, of which there are about sixteen varieties which have more or less of a reputation for quality on the general markets of the country, leaving about sixty varieties which are simply apples, and for which our growers will be for-

ORCHARD OPPORTUNITIES IN OREGON

on red fine shot; abundance of pure mountain water piped through tract; on main county road, telephone, R. F. D.; surrounded by hundreds of acres of finest commercial plantings in state. Improved as follows: 50 acres Mayette and Franquette walnuts, with Royal Ann and Lambert cherry fillers, three years old; 30 acres three-year-old apples, one-half each Yellow Newtowns and Spitzbergs; 70 acres Yellow Newtowns and Rome Beauties, entering second year; 50 acres oak and fir timber of marketable value; perfect land for fruit when in cultivation. This orchard has been planted under expert supervision and has had the best scientific care. We take special pride in offering this property for sale, and invite you to make a most thorough investigation. We have a map of this district, also a panoramic photograph of the property and surrounding country, that will be sent on application. We consider this property a bargain at \$36,000. Liberal terms will be given. We will be pleased to answer questions and show the property.

CHAPIN-HERLOW MORTGAGE & TRUST CO., 332-338 Chamber of Commerce, Portland, Oregon

tunate if they receive in the future the cost of production. We unhesitatingly say that the grower is going to waste his time in going to the expense of undertaking to put these low class apples on the market, and we suggest that the grower either ought to pull out these varieties and put up-to-date varieties in their place or top-work them by grafting them. The total number of shippers who have allied themselves with the union this last season are as follows: Growers of strawberries and small fruits 183, growers of apples and pears 316. The number of stockholders who have joined the union during the past year are 54. On the whole the crop for the season of 1911 was very much below what it was estimated at by the people of the valley early in the spring of 1911. We have, therefore, not been able to pay our running expenses out of our gross income this year. We have expended very large sums of money this season both for real estate, buildings and machinery, all of which are very necessary for the future purposes of the union, as we found it necessary to take advantage of the present time in order to make such preparation. The result of this is that we are considerably embarrassed financially. For instance, in order to be prepared for future emergencies we have installed largely increased machinery capacity both for refrigerating and for making ice. This with other necessary improvements in the buildings has cost us about \$9,000. We have also bought real estate directly south of our city warehouse at cost of \$2,100, upon which we think that it will be necessary in the very near future to erect a warehouse. We also expended \$2,000 in the building of a receiving warehouse at Odell station on the Mount Hood railroad, making a total of over \$13,000 in money which has been paid out since April 1, 1911, for increased facilities. We have also purchased what is known as the Wilson water power system, which has a capacity of 200-horsepower, for the sum of \$45,000, of which for the first two years we pay a monthly sum of \$400, with a note and mortgage covering just the property itself for a deferred payment of \$40,000 at six per cent interest; no payments on the principal to be made until after ten years. Therefore, the total cost per month of our water power after two years will be \$200 per month. At the present time we have consumers of this power who pay a monthly income of \$141. We think that we will have ample power from this plant for the future needs of the union. It is conceded by all refrigerating architects and engineers that the stability and evenness of water power for refrigerating purposes surpasses that of any other kind of power used for such purposes, and we think it is a fortunate move on the part of the directors to have secured this proposition. Our fixed expenses are very heavy, as follows: Our fixed interest charge is \$3,700 per year; our insurance and taxes are about \$1,000 per year.

Proof of Success No. 80

Schellenger Fruit Grading Machine Co.
Salt Lake City, Utah
Gentlemen: Replying to your inquiry as to how we like the grader, will say it does very well—we are using it every day.

Edgemont, Maryland, January 1, 1912.
Yours truly,
(Signed) JOHN A. NICODEMUS.

A Modern Maxim

Fancy prices are paid only for accurately graded and honestly packed fruit. You cannot expect such prices for poorly graded fruit, regardless of how good may be its quality. If you raise good fruit, do not throw away your rightful profits by neglecting to PUT IT UP IN AN ATTRACTIVE PACKAGE

The Schellenger 1912 peach and apple graders sort the fruit according to the CHEEK TO CHEEK diameter, into SIX SIZE GRADES. It places a fancy pack within the reach of every grower.

HADN'T YOU BETTER LOOK THEM UP?

Our new book, MODERN METHODS OF GRADING AND PACKING FRUIT, will be mailed you upon request.

EVENTUALLY YOU WILL WANT OUR ADDRESS.

SCHELLINGER FRUIT GRADING MACHINE CO., Inc.

OUR BEST REFERENCES ARE OUR CUSTOMERS

SALT LAKE CITY, UTAH

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HOOD RIVER
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First-Class House Plumbing
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Commercial Fertilizers
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Up-to-Date Garage and Machinery Shop

Tip Top Auto Company, Columbia Avenue, Hood River, Oregon

COOL MILK TO INSURE KEEPING

To supply healthier, more nourishing milk, to prevent its souring before it can be delivered, and to insure its keeping for twenty-four to forty-eight hours longer than under ordinary temperature, be sure to cool your milk.

A cooler costs very little. It pays for itself in a very short time, and is a necessity whether you have one cow or a hundred, whether you supply only your own family or a hundred.

We sell and recommend the CHAMPION, CHILLY KING and REID COOLERS.

Each is well built, strong and durable; easy to use and to keep clean, and the best cooler at the price on the market.

Prices range from \$4.00 up, according to size.

Our big FREE Catalog C 28 is profusely illustrated, gives complete information and prices. It will show you the way to larger milk profits. Send for it today.

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With this amount must be added the fixed charge for water power amounting to \$2,800 per year, and the fixed charge for engineers amounting to about \$2,100 per year, and the fixed office expenses, salaries, etc., besides other incidental expenses connected with the operation of the cold storage, such as oil, ammonia, packing, etc.; total \$10,000. A sentiment last spring was developed which caused the directors to have practically all of the supplies such as paper, arsenate of lead, etc., sold virtually at cost, so that whereas we made a profit of upward of \$5,000 off supplies in the season of 1910, we have barely cleared ourselves this season in the handling of the same. The question of by-products should be taken up later on for the reason that with our increasing output we will continually have more and more apples which will either have to be allowed to decay at the growers' homes or else made into cider, and the question as to whether or not more can be received from the working of these apples into canned goods, jellies, cider and vinegar and evaporated apples is well worth the attention of the people of this valley. We have ascertained from what little investigation we have made of this matter that on the basis of twelve and one-half cents per pound for the dried fruit product that the net returns to the growers have been ten dollars per ton for the green apples. Inasmuch as it takes a much better quality apple for drying than it does for making into cider it is doubtful, in our opinion, whether it is feasible to undertake the evaporating of apples when we can get around seven dollars per ton for the general trashy stuff which we sell to the cider mills; more especially so, as twelve and one-half cents per pound for evaporated apples is away above the average price for this product from year to year."

Plan to Finance Association

From North Yakima (Washington) Republic

A PLAN to finance the Yakima Valley Fruitgrowers' Association in a different manner than that now in effect has been under contemplation for some time past by General Manager Robbins, who intends to urge the new plan on the directorate in the near future, and if the directors think favorably of the idea it will be submitted to the membership for their consideration.

Under the plan now in force each member gives to the association a collateral note amounting to ten dollars for each acre of fruit land owned by him. These notes are used as collateral for raising money to purchase supplies and to pay other costs of operation until the regular returns come in from sale of fruit, when the notes are taken up. These notes cause some inconvenience because they form a constant outstanding obligation against the member's property. With the idea of making it possible to return these notes to their makers in the shortest possible time and still provide a fund

More PEARSON Nails

were bought and used during 1911 than ever before.

We have the best of reasons for predicting that the demand will be greater in 1912.

Quality Tells

The fruit packers appreciate that

PEARSON'S

are the only Cement Coated Nails to use. All others are imitations. Order PEARSON'S.

J. C. PEARSON CO.
SAN FRANCISCO & BOSTON
SOLE MANUFACTURERS

A. C. RULOFSON CO., 315 Monadnock Building, San Francisco
Pacific Coast Sales Managers

Smith's Self-Feed Nail Stripper

(For Hand Nailers)

Used in all box-making contests
because it is

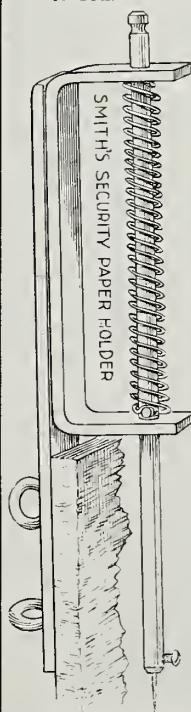
SELF-FEEDING. Fastest. No time lost in keeping full.

ADJUSTABLE. Handles all size nails from 2d to 10d.

HANDEST. Lightest. Weighs only 8 lbs. Closes like a suit case.

In general use by Pacific Coast packing houses.

Price \$10.00, delivered to any express office in the United States. (Liberal discount to the trade.)



Smith's "Security Paper Holder"

All packers realize the enormous waste of paper occasioned in the wrapping of fruits by the non-use of paper holders.

We guarantee this Holder will save its price in time and paper.

MOST CONVENIENT
Automatic and Non-Breakable

Price \$1.00 each, delivered at any express office in the United States. (Liberal discount to the trade.)

A. C. RULOFSON CO.
No. 315 Monadnock Building, San Francisco, California
DISTRIBUTING AGENTS

on which the association can do business, Manager Robbins proposes to have a by-law passed permitting a deduction from each box of fruit sold—five cents per box from apples and pears, two and one-half cents from peaches, plums, etc. For the amount thus deducted from the returns of each member the association will give its note bearing four per cent interest, and the member can use this note as collateral, or in any manner he may see fit. At the end of the first three-year period the notes issued the first year will be payable, those issued the second year will be payable the fourth year, and so on. Thus instead of the member being an apparent debtor to the association the latter in effect becomes a saving bank and becomes a debtor to the member, who draws regular savings bank interest on the loan.

In explaining the plan of the association to some inquiries from Wenatchee Manager Robbins wrote the following concerning this proposed new plan of finance: "In answer to the frequent objections to this proposed plan that it creates a liability and that our working capital or surplus fund represents an indebtedness of an equal amount; so long as the maturity of this indebtedness is so arranged that it will not disturb the stability and continuing value of this fund, we believe that the fact of its being a liability is an element of strength rather than one of weakness with a growers' organization, in that it carries a responsibility demanding conservatism and a careful preservation of each man's equity therein. Again, it automatically provides for its own distribution, constantly replenishing itself, always taking into account the changing membership and changing relations, avoiding what otherwise invariably becomes an insistent demand at some period for a distribution among the original contributors of a large surplus fund. If one ceases to be a member it adjusts itself nicely to his conditions, since he withdraws by means of his three-years' note his proportion and may by trade or discount of note dispose of it in any manner he desires. We believe that such notes would in a short time pass current in liquidation of debts and settlements in the communities where originating. There is no other factor of our plan or policy which we would change or modify at this time."

At the instance of an advertising agency we inserted in perfect good faith in some of our recent issues an advertising card at the bottom of the advertisement of "Black Leaf 40," Sulphate of Nicotine, setting forth that a firm in Portland is "general agents" for this material. We are informed by the manufacturers of "Black Leaf 40" that they have no "general agents" for this product, but that same is sold direct by the manufacturers to local merchants throughout the United States, and that fruitgrowers throughout the country may obtain "Black Leaf 40" direct from the local merchants.

Hemingway's Lead Arsenate

The brand that is used in all of the great apple-growing districts of the country—Western New York, Michigan, the Blue Ridge slopes, the Ozarks and the famous valleys of the great Northwest.

This product is of the highest standard of manufacture and has the following points of superiority:

Perfect Physical Condition

i.e., fineness of grain and ease in thinning down in water

Correct Analysis

i.e., full percentage of Arsenic Oxide (15% guaranteed) and no more than a trace of soluble arsenic, therefore no foliage burning.

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**Hemingway's London Purple Co., Ltd.
64-66 WATER STREET, NEW YORK CITY**

We Do Not Believe

there is any nursery, East or West, that enjoys a better reputation than ours for furnishing good, clean, healthy stock. We are willing to match our stock and service against any nursery in the world. For several years we have been supplying most of the trees planted in the famous Wenatchee Valley, and the tens of thousands of growing trees, furnished by us, speak louder than words.

We have a large and complete line of fruit and shade trees, ornamental shrubs, vines, roses, etc.

Our Customers Get What They Order

COLUMBIA & OKANOGAN NURSERY CO.

Wholesale and Retail

Wenatchee, Washington

**Save Your Time and Expense in Thinning Apples
BY THE USE OF**

Swengel's Portable Orchard Ladder



OPEN

which is becoming very popular with the fruit growers. "For thinning" fruit it has no equal as a time-saver. It brings the worker right up to his work, and he stays until finished. These ladders can be operated by children, and do no damage to the tree nor break off the fruit. Later in the season these ladders become very useful in gathering the fruit, which was the highest aim of the inventor. Try one and you will not desire any other.



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AGENTS WANTED

MANUFACTURED BY

**Orchard Ladder Manufacturing Co.
ST. JOHNS, OREGON**

New Residents

We are always pleased to extend courteous assistance to new residents of Hood River and the Hood River Valley by advising them regarding any local conditions within our knowledge, and we afford every convenience for the transaction of their financial matters. New accounts are respectfully and cordially invited, and we guarantee satisfaction. Savings department in connection.

Hood River Banking and Trust Company HOOD RIVER, OREGON

Yakima County Horticultural Association

THIS association has handled during the past season 237,728 packages of fruit of various kinds, aggregating a shipping weight of 2,190,770 pounds of soft fruits and 1,513,700 pounds for apples, or a total of 185 carloads. The number of packages of each kind of fruit is as follows:

	Apples	Pears	Peaches	Grapes (baskets)	Grapes (crates)	Prunes and plums	Berries	Cherries	Tomatoes	Cantaloupes	
	50,274	12,784	51,522	10,462	3,938	3,336	687	673	1,341	1,077	
Winesap	1.76	1.58	1.32								
Jonathan	1.42	1.54	1.19								
Spitzenberg	1.83	1.75	1.45								
Arkansas Black	1.70	1.56	1.35								
Delicious	3.40	2.08	1.88								
Stayman	1.50	1.35	...								
Newtown	1.40	1.40	1.25								
Ruby	1.43	1.34	1.10								
Rome Beauty	1.34	1.35	...								
Red Check	1.00	1.00									
Missouri Pippin	1.15	1.14	1.10								
Grimes	1.40	1.25	1.10								
Delaware Red	1.25	1.25	...								
Black Twig	1.28	1.21									
White Winter Pearmain	1.40	1.40	...								
Wagener	1.25	1.25	...								
Gano	1.27	1.27									
York Imperial	1.27	1.25	...								
Ben Davis	1.04	1.00									
Lady	3.10	...									
Assorted	1.24	1.24	...								
Hubbardston	2.41	2.22									

While these figures do not show up very well in comparison with the business done during the preceding season, still we handled a greater percentage of the valley's output than we did in 1910 despite the fact that we had much more competition. The apple averages on the different varieties are as follows:

	4-Tier	4½-Tier	5-Tier
Winesap	1.76	1.58	1.32
Jonathan	1.42	1.54	1.19
Spitzenberg	1.83	1.75	1.45
Arkansas Black	1.70	1.56	1.35
Delicious	3.40	2.08	1.88
Stayman	1.50	1.35	...
Newtown	1.40	1.40	1.25
Ruby	1.43	1.34	1.10
Rome Beauty	1.34	1.35	...
Red Check	1.00	1.00	
Missouri Pippin	1.15	1.14	1.10
Grimes	1.40	1.25	1.10
Delaware Red	1.25	1.25	...
Black Twig	1.28	1.21	
White Winter Pearmain	1.40	1.40	...
Wagener	1.25	1.25	...
Gano	1.27	1.27	
York Imperial	1.27	1.25	...
Ben Davis	1.04	1.00	
Lady	3.10	...	
Assorted	1.24	1.24	...
Hubbardston	2.41	2.22	

Our financial statement reads as follows:

Resources	
Real estate	\$32,500.00
Office furniture and fixtures	1,122.55
Warehouse tools and appliances	803.30
Permanent improvements	145.05
Treasury stock (1,273 shares)	12,730.00
Merchandise (inventory)	8,192.42
Office supplies	501.06
Purchase account, fruit	2,058.05
Accounts receivable	26,302.11
Notes receivable	1,196.78
Collection account, railroad claims and collections	5,328.46
Cash and bank balance	383.27
Total	\$91,265.05

Liabilities	
Capital stock	\$40,000.00
Amount due growers	7,423.17
Accounts payable	5,928.11
Notes payable	22,500.00
Surplus account	14,778.51
Profit and loss	635.36
Total	\$91,265.05

The new manager, E. E. Sampson, told of his experience as manager for the Vernon, British Columbia, Union two years. The government over there pays all expenses of packing schools.

Bitter rot and water core in the apples injured the sale, therefore dealers prefer those from the United States, although the tariff of twenty cents on a box of peaches is prohibitory, notwithstanding the output from British Okanogan is small and the crop uncertain. He knew pears to sell at Edmonton for five dollars per box. Mr. Padock was called on to state what he would do as traveling salesman. He said he would go through California and the states bordering on the Gulf of Mexico and study their crops and their methods of handling. He would establish headquarters either at Chicago, St. Paul or Omaha, and employ assistant salesmen for extensive districts. He said that all the expense of his department would be wasted unless the growers put up the very best pack possible.

In his annual address the president of the association said: "Today marks the close of another year in the history of our organization. We meet here

The First National Bank

Hood River, Oregon

F. S. STANLEY, President
J. W. HINRICHES, Vice President
E. O. BLANCHARD, Cashier
V. C. BROCK, Assistant Cashier

Savings Department Safety Deposit Boxes

Capital and Surplus, \$127,000
Total Assets over \$600,000

LESLIE BUTLER, President
TRUMAN BUTLER, Vice President
C. H. VAUGHAN, Cashier

Established 1900

Butler Banking Company

HOOD RIVER, OREGON

Capital fully paid - - - - \$100,000

INTEREST PAID ON TIME DEPOSITS

We give special attention to Good Farm Loans

If you have money to loan we will find you good real estate security, or if you want to borrow we can place your application in good hands, and we make no charge for this service.

THE OLDEST BANK IN HOOD RIVER VALLEY

LADD & TILTON BANK

Established 1859 Oldest bank on the Pacific Coast

PORTLAND, OREGON

Capital fully paid - - - - - \$1,000,000
Surplus and undivided profits - - - - 800,000

Officers:

W. M. Ladd, President
Edward Cunningham, Vice President
W. H. Dunckley, Cashier
R. S. Howard, Jr., Assistant Cashier
J. W. Ladd, Assistant Cashier
Walter M. Cook, Assistant Cashier

INTEREST PAID ON TIME DEPOSITS AND SAVINGS ACCOUNTS

Accounts of banks, firms, corporations and individuals solicited. Travelers' checks for sale, and drafts issued available in all countries of Europe.

today to review the results of the past year and to consider the preliminary plans for the future. The year, as we all know, has been one of peculiar conditions in many respects. The exceedingly light crop of fruit throughout the valley resulted in a small volume of business as compared with the year 1910. A season with light crops always increases the temptation of many growers to sell to the cash buyer. A few of our members withdrew, lured by the desire to try something new, but we also added several new members to our list, so that the percentage of our shipments, as compared with the total shipments of this station, is fully equal or exceeds that of the previous year. Last spring, in view of the conditions, we did not make a thorough canvass of our members for signing up their crops to us, consequently our salesmen were handicapped many times in their work, not knowing what limit to put on their sales for fear of selling beyond their ability to supply, which was done occasionally to our serious loss. This is a feature of our business that we must be protected in if we are to succeed in the highest degree of the business.

"From the present outlook the prospect is favorable for the Yakima Valley to ship five or six times the fruit it did in the year 1911, and if so we will all be taxed to the utmost with the present facilities to distribute it and get the best results, and it cannot be done without the aid and hearty co-operation of our members. Your board of trustees, having faith in your loyal support, has engaged Mr. Sampson to take the management of our union for the coming year, a position which he resigned three years ago to take a similar position with an association in British Columbia. He returns to us with the added experiences gained from a wider field of action and acquaintance, and naturally greatly increased opportunity for the sale of our fruits. Mr. Paddock, whose ability as a salesman, combined with his experience and knowledge of the fruit business in general and our business in particular, we decided would be a valuable man to send east to represent us in the markets. We have also in view other salesmen of experience to assist him, the number to be determined by the volume of business assured to us by signed contracts from our growers. The earlier this is done the better we can perfect our plans and the more markets we can reach, with better results for us.

"Our union, supported by a large number of its members, has labored long and faithfully to establish a reputation for its fruit that the buyers would recognize as thoroughly reliable. We feel our efforts have been crowned with a measure of success, and I can confidently say that our 'Blue Ribbon Brand' is more widely known than any other apple brand from the Northwest. We want its reputation extended to every apple-eating community in our country. Each year has shown a wider distribution in foreign countries, where



FROM ITS VERY CONCEPTION TO
THE PRESENT TIME THE

Apollo Player Piano

HAS BEEN NOTABLY IN ADVANCE OF
ALL SIMILAR INSTRUMENTS

The Genius of its Inventor Melville Clark

MOMBINED with persistent and costly experiments have made the Apollo of today so individual as to be in a class by itself. If you are unable to hear an Apollo in our ware rooms, may we send a booklet which illustrates and explains the following features that are absolutely essential to the correct production of piano music. The solo theme, the downward touch, the metronome motor, all of which are exclusive to the Apollo.

For catalogue, prices, terms, etc., address

Sherman Clay & Co.

Morrison at Sixth

PORLAND, OREGON

COMMERCIAL ORCHARDS All in Bearing, and in some of the Best Proven Fruit Sections of Virginia

- (1) 250 acres mountain land. Over 2,500 apple trees, one-half beginning to bear. Some of the land is rough, but the trees are well grown and very thrifty. 4½ miles down grade to station. Price \$10,750. *A GREAT BARGAIN.*
- (2) 160 acres at foot of Blue Ridge. About 5,000 trees, 1,200 apple 18 years old, balance just being planted; 1910 crop 1,000 barrels. 3½ miles over fine road from station. Price \$20,000.
- (3) In select fruit region close to progressive town, 160 acres practically all planted in fruit. About 6,300 apple trees five years old, 200 six years old and 1,000 one year old; 15,000 peach trees five years old; fine property, worthy of immediate investigation, purchasable at investment figure. Price \$60,000.
- (4) About 7,000 apple trees, all in bearing and from 7 to 17 years old. Rich land, one-third in orchard, balance mostly blue grass sod. Owner reports 1910 apple crop brought \$9,000 net. Distance to station 1½ miles. Price \$65,000.
- (5) Contains nearly 15,000 apple trees 11 to 15 years old, within one mile of two competing railroads. Elevated land, good air drainage, within five miles of large city. Cheap property. A few good crops should pay for it. Can be bought for about \$120,000.

Other Fine Orchards. Write for List.

H. W. HILLEARY & COMPANY, 729-30 Southern Building, Washington, D. C.

it has been highly satisfactory. With our fruits properly graded and packed to comply with the requirements of the 'Blue Ribbon Brand' there will be no such thing as overproduction.

"In regard to prices obtained for the past year, as shown by the manager's report, I think they are generally satisfactory and will compare favorably with those of any other organization; and where the cost of handling and selling through the union is taken, in comparison with others, the net returns to the growers will greatly exceed them all. The net returns to us as growers is what we are all after, and not the high prices from which two or three commissions are later deducted before reaching the producer. Our prices per box for selling are twenty per cent less than similar organizations of Wenatchee, Hood River, Milton and Rogue River, and less than half what some others are charging. With the light crop during the past year we paid all expenses and a small surplus. With a normal crop we can, on our present basis, earn a reasonable dividend for our stockholders and establish a fund with which to buy supplies on a cash basis, and furnish to growers at a very small margin. This cannot be done without your support, and without your without your support in some sort of co-operation in the distribution of our fruit the future will be disastrous to us all in the fruit business, but with intelligent work and loyalty on the part of our members we cannot help but succeed. No doubt some of you have been disappointed in not receiving a dividend a year ago when the books of the company showed one earned. An unfortunate condition exists which made it seem unwise to the board to declare a dividend at that time. A London firm, J. Nichols & Son, to whom about seventy-five cars of apples were sold, still owing us a large amount. Mr. Nichols, who had been here during the shipping season, died almost immediately after reaching home, which left his affairs in bad shape. We took steps immediately to protect our interests through attorneys in London, but the prospects are anything but hopeful and without doubt there will be a heavy loss when settlement is made.

"We have on hand 1,273 shares of treasury stock which, at par, amounts to \$12,730. During the past year no special effort has been made to dispose of this, and in order to carry our necessary supply of material and book accounts we have used our credit at the bank. In order to relieve the bank and to get longer time loans we have recently negotiated a loan of \$12,000 and paid off one of \$3,750. By the sale of treasury stock this loan can be disposed of. There has been a great deal said of late about furnishing supplies to growers at cost. What is cost? Not just what is paid the manufacturer. You must add to that freight and cartage, labor of handling, rent of warehouse, bookkeeping, postage and stationery, interest on book accounts not paid when due and various other items,

**MYERS
SPRAY PUMPS AND NOZZLES**

are made in many styles and sizes to meet every spraying need from the small knapsack or bucket outfits to the large power rigs. They have all been developed in line with modern spraying requirements and have long since passed the experimental stage. We show here a few types of our complete line of Spray Pumps, Nozzles, Bamboo Extensions and Accessories. Our new catalog No. Sp-12 will give you full descriptions and prices.

WRITE FOR IT NOW.

**F.E. Myers & Bro.
Ashland Pump & Hay-tool Works**

120 Orange Street ASHLAND, OHIO.

Distributing Agents
MITCHELL, LEWIS & STAVER CO.
Portland, Oregon Spokane, Washington Boise, Idaho

Idaho Pine Makes the Best Fruit Boxes

MANUFACTURED BY THE
LEWISTON BOX CO., Lewiston, Idaho

THINGS WE ARE AGENTS FOR

Knox Hats
Alfred Benjamin & Co.'s Clothing
Dr. Jaeger Underwear
Dr. Deimel Linen Mesh Underwear
Dent's and Fownes' Gloves

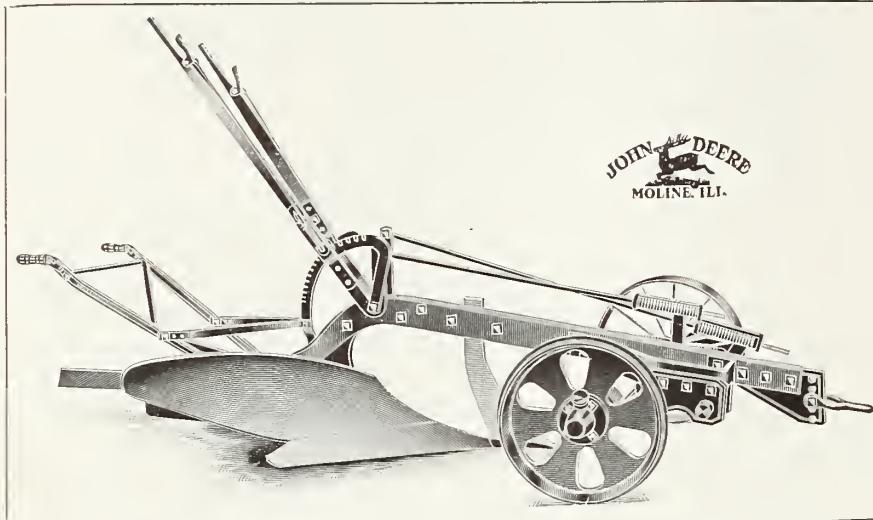
Buffum & Pendleton
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Portland, Oregon

The Paris Fair

Hood River's largest and best store
RETAILERS OF
EVERYTHING TO WEAR
AGENTS FOR
HAMILTON & BROWN AND
THE BROWN SHOES
HART, SCHAFFNER & MARX
CLOTHES
MANHATTAN SHIRTS
JOHN B. STETSON HATS
NEMO CORSETS
Strictly Cash—One Price to All

John Deere Jumbo Grub Breaker

FOR USE WITH TRACTION ENGINES



Will cut off roots and small stumps several inches in diameter.

All Steel—Very Heavy—
Weight 1325 Pounds.

Strong enough to stand pull of high powered engines. Cuts a furrow 24 inches wide and any depth up to 10 or 12 inches.

Write for particulars **John Deere Plow Co., of Portland, Oregon**

PORTLAND

SEATTLE

SPOKANE

BOISE

all legitimate and unavoidable, and must be paid in some manner. It sounds good to say that we can sell to you an apple box for ten cents which we have bought at the mill for ten cents, but if our business stopped there how long would we continue doing business? The extra cost must be paid by you, and it cannot be dodged. The grocer who pays five dollars for a sack of sugar and sells it to you for five dollars has got to increase his price to you on the other products out of their legitimate proportion or go out of business. I believe in asking a price on each article to cover all legitimate costs

and no more, and so be able to handle our fruit on a lower basis than can possibly be done where cost of handling supplies is added to the cost of selling our fruits.

"One other important thing I believe would be of great value to this union. I have taken it up with the board and it meets with their hearty approval, and it is this: An executive committee of either two or three members should be appointed or elected by the board from their number, whose duty it shall be to meet weekly, spending the entire day when necessary at the company's place of business, to confer with the manager on all important affairs of the union, advising with him, suggesting changes or improvements in their judgment necessary to the benefit of the business; to meet any grower who might wish to consult with them on any matters pertaining to their relations with the union, etc. This committee to report to the board at each regular monthly meeting or at any special meeting called for the purpose in cases of emergency requiring it. Now this would be a great relief to the board at large and with better results to the union by reason of the more frequent meetings, giving the manager the support of their counsel and advise. They should be paid a fee of five dollars each per day for their service. The full board should also be paid a greater per diem than the \$1.50 now paid. It is valuable service, conscientiously given, and it is unfair to ask it year after year. My

term will soon expire, so my modesty permits of me bringing this to your notice. Right here let me say, I would much rather our union would do a reasonable volume of business that will bring satisfactory results to us all than to attempt a large volume beyond our ability to handle well. Now in closing and in behalf of your board of trustees, I want to appeal to your business intelligence and interests to give our union your support, all that it merits, and in so doing we can have the best organization in the Northwest, if not the largest."—Exchange.

Hood River Grown Nursery Stock for Season 1911-12

Standard Varieties

Prices Right and Stock First Class

C. D. THOMPSON, Hood River, Oregon

S. E. Bartmess

Undertaker and
Licensed Embalmer
For Oregon and Washington

Furniture, Rugs, Carpets
and Building Material

HOOD RIVER, OREGON

FREE

Test of the famous Tower Orchard Cultivator and Pulverizer for any seed bed.

To responsible parties only.

It's a star performer, as the big sales prove.

R. A. BAKER, Western Agent

The Tower Line

NAMPA, IDAHO

TO DESTROY APHIS, THrips, ETC. Without Injury to Foliage

SPRAY WITH

"Black Leaf 40"

SULPHATE OF NICOTINE

"Black Leaf 40" is highly recommended by experiment stations and spraying experts throughout the entire United States.

Owing to the large dilution, neither foliage nor fruit is stained.

Also, "Black Leaf 40" is perfectly soluble in water—no clogging of nozzles.

PRICES:

10½-lb. can, \$12.50—Makes 1000 gallons, "5/100 of 1 per cent Nicotine"
2½-lb. can, 3.25—Makes 240 gallons, "5/100 of 1 per cent Nicotine"
½-lb. can, .85—Makes 47 gallons, "5/100 of 1 per cent Nicotine"

These prices prevail at ALL agencies in railroad towns throughout the United States. If you cannot thus obtain "Black Leaf 40," send us postoffice money order and we will ship you by express, prepaid.

The Kentucky Tobacco Product Company
INCORPORATED
LOUISVILLE, KENTUCKY

Economics of Orcharding

By H. H. S. Rowell, Secretary Lewiston Orchard Producers' Association

THAT "order is heaven's first law" is a saying that might well be applied, in principle, to the development work in Lewiston Orchards, an irrigated orchard district of 5,000 acres adjacent to the City of Lewiston, Idaho. That the prevalence of system and order is the most striking characteristic of the district is apparent even to the casual visitor. To the resident orchardist the exact system followed becomes a part of his every-day life and remains a constant object lesson in economic methods. The uniform fences, the level, graded, shaded streets, the wide alleys, the quarter-mile square

blocks of four ten-acre (or eight five-acre) lots, the water supply by underground pipe system from a great reservoir, fed by a mountain drainage basin of one hundred square miles are all features of the orderly system that prevails throughout the district.

The economics of orcharding are further exemplified in the practical details of development work here from the plowing of the ground to the harvesting of the crop. By the use of steam plows, the buying of supplies in carload lots and in many other ways the greatest service at the least expenditure of money, time and energy is obtained in all departments of the work. A large central camp, besides a smaller camp, is maintained, and here the greater portion of the 260 men and 260 head of horses and mules are quartered. Here also are repair shops for the agricultural machinery, including as it does three powerful gas traction engines, twenty-five disc plows, 157 common plows, from 50 to 60 harrows, one roller, 35 Kimball cultivators and four power sprayers. The force of men and teams, as named, is the average one, as it varies greatly during different portions of the year. In January and February, comparatively little is done, it being a time for preparation. Machinery is repaired, root grafts are made and a little pruning is done. March and April are busy spring

Butte Potato & Produce Co.

BUTTE, MONTANA

Jobbers of all Farm and Orchard Products

We have a large outlet for fruits and vegetables. We want to hear from shippers.

A. J. KNIEVEL
President and Manager

Sixteen years' experience on the Butte market.

months, when plowing, cultivating, pruning and spraying, planting and replanting are the principal operations. In May cultivation continues and irrigation sometimes begins. June and July are devoted to cultivation and irrigation. From July 25 to August 1 cultivation ceases with the making of a final dust mulch, and summer pruning and a general cleanup of weeds follows. Care is also taken of any orchard products. In November and December some plowing and tree planting are done, grape vines are pruned and covered and there is a general preparation for winter weather, which seldom comes here until near the close of December and then lasts only two or three weeks.

The work by the company's force is in the development of new tracts and in the care of others, during the development period, for non-resident owners. During the year 1911 an acreage of 4,342.11 was managed by the company at a total cost of \$60,861.72, an average cost of \$14.10 per acre. This covers the cost of actual field work, but does not include the horticultural expense and horticultural supervision for which there should be added an average of fifty per cent. Eighteen different tracts are included in the record of operations for the year. Of these four were one-year-old orchards, with an aggregate acreage of 917.90; four were two-year-old orchards, with an aggregate acreage of 1,508.87; four were three-year-old orchards, with an aggregate acreage of 544.39; two were four-year-old orchards, with an aggregate acreage of 387.13; three were orchards of mixed ages, with aggregate acreage of 818.82, and one was a vineyard tract of 165

A Snap On an 80-H. P., 4-cylinder Hart Parr Traction Engine; used only six weeks. Write for full particulars to Reierson Machinery Co., Portland, Oregon.

PORTLAND WHOLESALE NURSERY COMPANY

Rooms 1 and 2 Lambert-Sargeant Building, corner East Alder Street and Grand Avenue PORTLAND, OREGON

Spruce Box Shooks IN CAR LOADS

NORTHWESTERN LUMBER COMPANY

HOQUIAM, WASHINGTON

Prompt Shipments



The New Panel-End Box

The Washington Mill Company, of Spokane, Washington, is leading in the betterment of fruit boxes, by using the BILLINGSLEY PATENT MACHINES.

The Anaconda Copper Mining Company are installing our system at Hamilton, Montana, and will be ready for the coming fruit season.

Ask your dealer for PANEL-END BOXES, lightest, handsomest, strongest—forms a good hand-hold at both ends of box.

Substantial millmen are requested to correspond with

Billingsley Box Machine Company, Ocala, Florida



**Two To Chicago
One To
St. Louis**

OVER THE SCENIC HIGHWAY

**Daily
Trains of Highest Order**

The Standard Railway of the Northwest has frequent trains from and through its chief cities to Minneapolis, St. Paul, Milwaukee, Chicago, Kansas City, St. Louis. Immediate connections to Duluth, Superior, Winnipeg and all points East and South.

Service that Sets the Pace.

Let us ticket YOU.

Full information gladly furnished on application

A. D. CHARLTON
Assistant General Passenger Agent
PORTLAND, OREGON

Annual Rose Festival, Portland, June 10-15, 1912
Montana Festa, Tacoma, June 30-July 4, 1912
Grand Lodge, Order of Elks, Portland, July 9-13, 1912
Golden Potlatch Carnival, Seattle, July 15-20, 1912
Yellowstone National Park, Season June 15-Sept. 15, 1912
Panama-Pacific International Exposition, San Francisco, 1915

Northern Pacific Railway

Original, Direct and Only Line to Gardiner Gateway, Official Yellowstone Park Entrance

acres. The cost of improvement work varied considerably, even in orchards of the same age, owing to varying conditions of soil, distance from the camp and varying acreage of different tracts. In the case of the one-year-old orchards the cost ranged from \$14.43 to \$23.62 an acre, the average being \$18.49. For the two-year-olds the range was \$6.95 to \$13.21, the average being \$9.55, the minimum being for a tract that did not require irrigation. For the three-year-olds the range was from \$8.52 to \$19.23, the average being \$13.35, the maximum being reached in the case of a tract that had both cover crops and grapes. For the four-year-olds the range was from \$13.43 to \$21.97, the average being \$17.70, the maximum being in the case of a tract that had cover crops. For the tracts with orchards of mixed ages the cost ranged from \$14.50 to \$20.55, the average being \$14.27, the highest being for that of least acreage, and consequently allowing less economy of labor. For the vineyard tract the average was \$14.10 an acre. With the exception of the tract not irrigated the lowest cost was for a two-year-old tract of 1,037.16 acres, the acreage of this being much greater than that of any other, and consequently more advantageously operated. The highest average was for the one-year-old orchards, owing to more work being required for first preparation. The second year showed the least expense, being about half that for the first year. For the third year the increased cost was about forty-five per cent, and for the fourth year a similar increase was shown. The average for the tracts of mixed ages was, consistently, almost exactly the average of all the other tracts, the average for the mixed tracts being \$14.27; that of the one, two, three and four-year-olds together being \$14.77, and that of all tracts, omitting the vineyard tract, being \$14.52.

There were sixteen different classes of operations, some of these being many times repeated, thus making the work here equivalent to the handling of eight to ten times as much acreage of farm land. The least expensive work was that of weeding, and that of greatest cost per acre was the trellising of grapes; but for strictly orchard work the most expensive was planting. The pruning of 2,059.59 acres cost \$3,203.06, an average of \$1.55. The spraying, one time, of 1,629.38 acres cost \$1,791.07, an average of \$1.10. The plowing of 4,106.27 acres cost \$8,187.92, an average of \$2 an acre, though the former average was \$4, the reduced cost being the result of using steam ploughs for a portion of the work. The giant "Caterpillar" will cover forty acres a day, and is sometimes operated both day and night. It is used for cultivating and harrowing as well as for plowing. The harrowing of 4,342.11 acres, from five to seven times, cost \$5,305.64, an average of \$1.22. The disk-ing, from five to seven times, of 3,943.53 acres cost \$2,767.15, an average of 70 cents an acre. The planting of 1,463.64 acres cost \$16,339.99, an average of

\$11.15; and the replanting of 2,751.28 acres cost \$3,310.45, an average of \$1.20. The cultivating, two to three times, of 4,342.11 acres cost \$9,288.78, an average of \$2.14. The hand hoeing of 4,342.11 acres cost \$4,526.57, an average of \$1.04. From two to four irrigations of 663.40 acres cost \$4,624.47, an average of \$2.75. The fertilizing of 466.40 acres cost \$534.03, an average of \$1.14. The tying of 63.40 acres of grapes cost \$172.06, an average of \$2.71; and the trellising of 2.68 acres cost \$183.54, an average of \$68.48. The staking of 1,176.06 acres cost \$602.63, an average of 51 cents. The rolling of 38.41 acres cost \$17.93, an average of 51 cents, and the weeding of 15.07 acres cost \$6.43, an average of 42 cents.

The operations that were repeated from two to seven times were those of harrowing, disking, cultivating and irrigating. Of these the average for a single operation was the lowest for diskng, 12 cents; that for harrowing being 20 cents; for cultivating being 86 cents, and for irrigating 91 cents. The cost of irrigation is kept low by the convenience of the piped system. The spraying expense is lessened by the maintenance of a plant for the manufacture of the spraying mixture, which is used by the company and sold at cost to the orchardists. The constant aim of the management is to reduce the average cost, while increasing the efficiency of service, the purpose being to make all development work an economic success, both for the orchard owners and for the company itself. The tendency of improvement in service being to constantly advance land values. For all orchards absolutely clean cultivation is the rule, and the appearance of these is in pleasing contrast with the traditional farm orchard, which has too often resembled a weed field or brush patch. The practical study of orchard economy has a successful demonstration in these scientific, systematic business operations, where all expenditures and processes are the subject of exact record.

Editor Better Fruit:

I beg to acknowledge receipt of your favor of the 13th inst. stating that you will be pleased to publish a letter from me setting forth what we would like in the way of fruits and vegetables for our exhibit, and also to make editorial comment on the subject. In reply I beg to say that we want small quantities of perfect fruit and perfect vegetables of commercial size which are in proper condition for shipment, so as not to get bruised. If overripe they will reach us in a condition which will not permit of them being processed, but they should be as near ripe as possible and yet be solid. With fruit we would like a portion of the limb and also the foliage, and with vegetables we would like the tops and the foliage. We only want commercial fruits and vegetables, not caring to preserve any freaks or extra large growths. The object is to show in the exhibit what is raised for commercial purposes. We will process this fruit, put it on exhibition in our rooms on the ground floor at No. 69 Fifth street, Portland, Oregon, placing on the jars the name of the grower, the place where grown and the variety. This will all be done at our expense, and all we ask is that the fruits and vegetables be sent in to us. All shipments should be carefully addressed to the Secretary of the Chamber of Commerce, No. 69 Fifth street, Portland, Oregon. Thanking you for your kind offer, I am, very sincerely yours, E. C. Giltner, Secretary.

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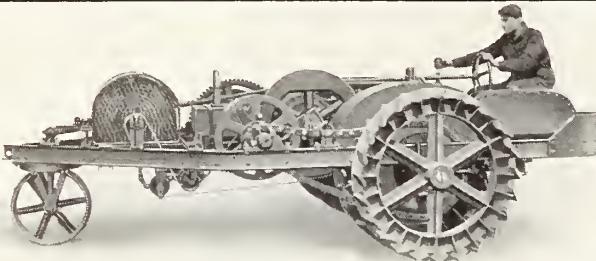
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Practical Value of the Pest Control

By Professor W. H. Volk, Horticultural Commissioner, Watsonville, California

A FEW years ago many people would have seen little scope in the title of this article. It has only been a comparatively short time since the average agriculturist looked with much skepticism on any efforts to assist nature in withstanding the ravages of plant pests. Especially were any suggestions which might emanate from the impractical brain of a university professor held in distrust. In the first place, it was quite out of the question for the student of books to know more about the development of a crop of potatoes than the practical farmer who had planted and harvested this vegetable all his life. Again, the ability to make correct observations, even of very simple phenomena, is a gift which comes naturally only to a few people. This led to ascribing many causes to the failure of crops, such as planting at the wrong time of the moon. Indeed, as long as agriculture was confined to the production of annual field crops there was little encouragement for the development of scientific pest control methods. With the rise of the orchard industry a new element was introduced, that is, a valuable investment came into existence in the form of bearing trees. The owner of an orchard was not going to look with complacency on the inroads of

pests which would destroy the results of several years of hard work. Experimenting with divers mixtures, decoctions and methods necessarily followed. At first there were many faulty observations, and the work was largely unscientific. Nevertheless some good things were blundered upon, and sufficient success was obtained to establish a certain amount of confidence in such efforts and to create a demand for specialists who might bring the crude methods to a state of relative perfection.

It must not be supposed that the direct method of fighting pests was the only course of these investigations. In fact a number of schools were soon established, and the general aspect of the situation grew to appear quite similar to that of human medical practice. In both cases the comparison with a circus, surrounded by side shows, is quite apt. The big tent contains practically everything that may be found in all the little tents, and much more besides, but the sightseers could never gain this impression by listening to the criers at the tent doors.

In the control of plant pests there is, first, the broad school which bases its conclusions on the outcome of experiments and careful study of a wide range of conditions and phe-

nomena. The most expedient methods are the ones chosen for any particular case, and may differ radically from those employed in another case. In the broadest sense, this school must disregard no means which may be suggested until its expediency has been disproved by sufficient experimental evidence. In this connection it should be stated that the unscientific experimenter, while the chances are largely against him, may at any time stumble upon something of value. It is the province of the scientists to carefully weigh such results and interpret their meaning. Possible methods of attacking most of the important problems are

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so diversified and the tendency to lose sight of many in the pursuit of one particular line is so strong that one-sided investigators are frequently produced. We can readily discover a number of distinct factors which may influence the development of growing crops. They all bear on one presupposed condition, that is the presence of an adequate medium in which to grow, the earth and the air and a sufficient force to supply the energy of growth, solar radiation.

It is possible to modify some of these conditions and thereby affect the nature of growth. In a state of nature things are assumed to have found their natural level and exist in this balanced condition without any need for artificial intervention. Especially has this point been urged with reference to plant pests. It appears to be a well established fact that insects all have their natural enemies, and this preying of one upon the other prevents the annihilation of plant life. On the other hand, is the efficiency of this interaction of enemies sufficient for the purpose of man in producing a successful crop? A considerable school of plant doctors think that it is. The parasitologist is convinced that pest control efforts should be largely, if not entirely, directed toward studying and assisting the natural enemies of plant pests. How far do the facts justify such an extreme view? The first and fundamental premise in this theory is that in a state of nature plants are not seriously injured by their enemies. Many people accept this as a fact without giving the matter any thought. In reality this premise is contrary to experience. Plants in a state of nature are not thriving to the point of efficient production of their fruit crops. In reality they barely succeed in perpetuating themselves. Any good observer may readily discover that insect pests and diseases play a large part in this unfruitfulness. However, is the failure of this fundamental premise an unqualified indictment of the methods of the parasitologist? Returning again to experience, we find that some marked successes have attended his efforts. In extending agriculture to new lands and climates the introduced plants may develop special tendencies or the pests may find more congenial conditions. It is not possible to foresee these effects of environment; sometimes it is in favor of the crop and sometimes the pest. Under such conditions the introduction of any enemy of a pest has proven effective in certain cases.

Natural methods of control are not confined to the introduction or propagation of parasites. There is one very important property of living things which may be turned to account, that is the power to develop a natural resistance to disease. Very minute changes in structure or composition may affect fungus and bacterial parasites. Resistant types spring up as a result of natural variation. By selecting these types an economic degree of resistance may be obtained. Much of

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value has already come of this line of endeavor. But the adaptability of one line does not presuppose the futility of another. It is a very grave mistake for the investigator to take for granted the futility of a method on the ground of past failures or a calculated prohibitory expense. It should always be remembered study may be able to reduce the expense and increase the efficiency to a point where the former calculations do not hold. I know of an important investigation where all effort has been concentrated on the development of a resistant type, and the direct method of attack almost entirely neglected on the basis of such calculations. The outcome cannot be predicted, but the procedure is not justified by experience. The point I wish to bring out is that a search is unthorough and unscientific in direct proportion to the ground it leaves unexplored. A still different method of attacking the pest problem lies in encouraging natural growth under the assumption that a strength may be developed which will resist disease. This proposition has been aptly stated as fighting the tree rather than the disease. Unquestionably there are numerous instances in which such a method will prove successful. Fertilizing and stimulation are the instruments in the hands of the doctor, and his clinic occupies a space in the large tent, but should not become a side show.

I cannot take space to discuss all the indirect methods used in combating plant pests, but there is at least one other that deserves special mention. This is quarantine and eradication. Germs and disease cannot arise spontaneously, but must be propagated from their own kind. Then an efficient quarantine will prevent any trouble from exotic pests. Perhaps no statement made in this article is more rigidly uncontested, yet in actual practice this method of fighting pests has been far from satisfactory. Pests have spread from country to country as a natural consequence of commerce, and it is not possible to say exactly how much the quarantine methods in practice have retarded this spread. A close scrutiny of the situation makes it appear that natural barriers have been far more important than those erected by man. Climatic conditions determine the ultimate limits to which any pest may spread, and it is quite probable that these ultimate limits will be reached in spite of a well developed quarantine system. The whole question hinges on the efficiency of the quarantine. It is considered an axiom that nothing can be absolutely perfect; the best that can be done is to approach perfection. Evidently a quarantine system which guards all avenues of entrance must be very elaborate and expensive. This increase of expense will prove a limiting factor to efficiency, and the whole question must be subjected to the most careful scientific scrutiny. The attitude of regarding quarantine as a purely administrative and executive function is grossly

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in error. It is simply a factor in pest control to be considered along with the rest, and in the same manner.

Hand in hand with quarantine goes eradication. No dictionary word has been more recklessly handled than "eradication." Numerous horticultural laws enjoin its officers to eradicate pests. These laws have been on the statutes for a generation and yet it is not demonstrated that eradication has been accomplished in a single instance. I do not mean to imply that the entire extermination of a pest over a given area cannot be accomplished, but that in practical experience we are not destined to achieve it sufficiently often to influence our calculations and methods. Yet eradication becomes a necessary part of quarantine for any pest which may break through the lines and become established at some point, and must be eradicated in order to prevent its further spread. The constant tendency of eradication is to fall away from the rigid dictionary definition and become a synonym of control. Control is easily possible, while eradication is always unattainable. Now, passing from the indirect methods of control, I wish to discuss the direct procedure. Such methods are those which attack the pest directly, kill it and leave the plant in normal condition. Spraying and fumigation naturally come to mind as the most common examples of this method of pest control. Yet it should not be inferred that these means are exclusively direct methods. The reaction of spray materials on the plant may play a distinct part, that of stimulation or injury. If stimulation adds to the natural vigor of the plant and helps to overcome the adverse conditions. The direct methods have much diversity and are at a distinct advantage in that they may yield immediate returns. Such advantages have caused the direct methods to greatly outdistance the others in variety and mass of literature. They cannot be said, however, to be of overshadowing importance, and may even decline to some extent in the future. The same contentions hold for these methods as for all others, namely, that they occupy a place and must be given due consideration in any truly scientific study directed toward the solution of a given problem.

Other ways or methods of arriving at the same end may be imagined, but I have failed to discover any which are independent of the others or which do not depend on the general principles underlying agriculture. The economic science of pest control is now divided into several branches. These are so closely interrelated that the workers in one branch must frequently enter the fields of the others. All draw heavily from the pure sciences, such as chemistry, botany and physiology. This interdependence should presuppose harmony and co-operation, but unfortunately there are many investigators who do not seem to realize the vast extent of the field in which they are working. Jealousies and antagonisms frequently distract from the

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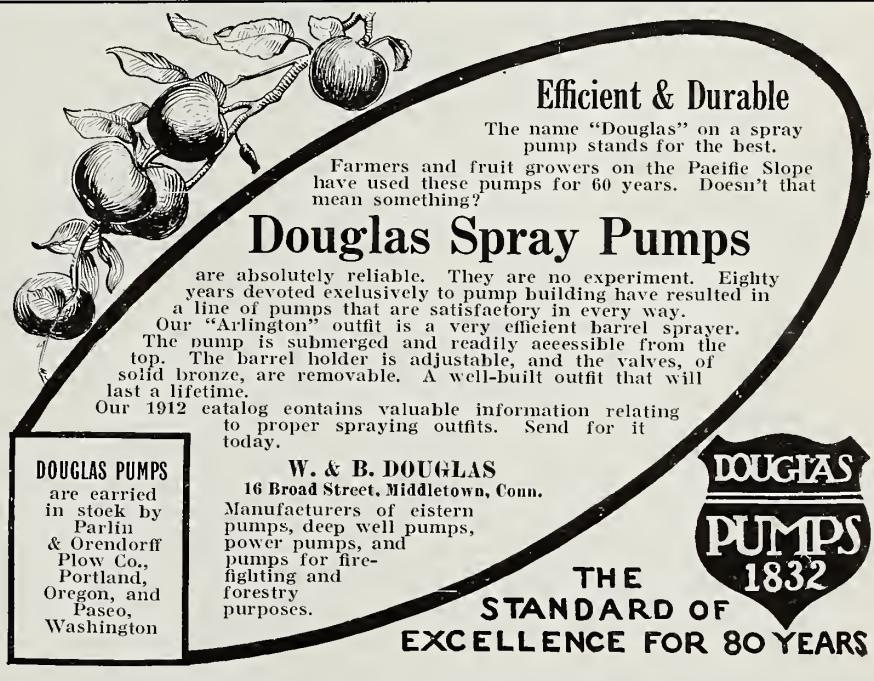
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main issue, due to the fear that one man may get into print first with a given fact or discovery. A little thought should bury all such contentions. In the first place results and facts are what is desired, and, secondly, the final word is never said on any topic. If a given piece of work is duplicated, or even garbled, it only establishes any real facts in the case the more firmly and makes a sure stepping stone to more important results. Professional jealousy should be so rare as to be practically unknown, but I regret to confess that it is a very live issue in this branch of science.

These plant pest investigations are becoming yearly more important to agriculture in general and are of special interest to the fruit industry. They are supported almost wholly from the public treasury, be it county, state or federal. The public is not interested in the contentions of individual investigators, but wants results of practical value. The more abundant the results the more liberally will the public moneys be expended in extending the scope of the investigations, and the more secure will the position of the investigators become. I may be considered radical by many, or even impossible by some, but I am convinced that the laboratory facilities of these various public institutions should be inter-available, and even the unpublished work of the investigators should be at the disposal of any who are interested.

Editor Better Fruit:

As private secretary of Mr. Gustav Henckell I wish to inform you that Mr. Henckell wants to renew his subscription on "Better Fruit." Mr. Henckell, who is largely interested in orcharding in Switzerland and France, likes your paper very much and he always took a deep interest in the way things are done in the West. I visited your beautiful country a year ago and I find that there is no other magazine in the United States that will bring so much news about orcharding as yours. Very truly yours, G. F. Zeiler, Lenzburg, Switzerland.

The New Jersey Fruit and Produce Company (chartered under the laws of New Jersey) held its second annual meeting on February 11, 1912, and elected the following officers: John C. Lee, president; E. E. Anderson, vice president; John S. Conroy, secretary; Malvin L. Janes, treasurer; Ezra B. Marter, general manager; James J. Conroy and William F. Davis, directors. This company has 525 acres of new land situated one mile south of Glassboro, New Jersey, which they are setting in fruit. They now have over 30,000 trees set and are going to finish planting the entire tract this season. This farm is adjacent to the Repp and Stanger farms, which together comprise about 1,000 acres of fruit trees. Elmer E. Anderson, Burlington, New Jersey.

A. C. Rulofson Company, the Pacific Coast agents for the J. C. Pearson Company, Boston, Massachusetts, manufacturers of "Pearson cement coated nails," have perfected and are putting on the market two very useful inventions for use in packing houses. Their advertisement appears in this edition. Mr. Rulofson's lifelong identity with the cement coated nail business has given him exceptional facilities for learning the requirements of the boxmaker, and his endorsement of the "Smith nail stripper" should be sufficient guarantee to any "doubting Thomas." The stripper is sold on the guarantee of giving perfect satisfaction. The same parties are also putting on the market the "Security paper holder," which is an ingenious device for holding fruit wrappers. It is convenient and saves time, and is inexpensive.*

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Of late all cities are looking to the City Beautiful. Could anything be more delightful to see than the vacant lots and hillsides covered with blooming plants or growing greens. In order to aid the beginner we offer the following suggestions—

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The Greatest Market of the Old World

Henry C. Shelley in *The Argonaut*

COVENT GARDEN is not a garden, but a market; a market, however, which depends upon a garden. And it was a garden once, but a "convent" instead of a "covent" garden. For in the bygone centuries that spacious and busy square which is London's chief mart for the flowers and fruits of the earth was the garden of the Abbey of Westminster. It was distant from the abbey about a mile as the crow flies, with the quaint village of Charing lying between, but that was no drawback in the leisurely days of old. Here, then, was once a veritable garden, encompassed by thick-set hedges, umbraeous with lusty trees, rich in verdant lawns, and not innocent of more utilitarian beds from whence

the old monks replenished their refectory table. Hence the name of Covent Garden, from which, with characteristic London slovenness, the "n" has been dropped, thus giving the "Covent" which is neither flesh, fowl nor good red herring so far as etymology goes.

From a garden it became a square, in effect, though, not in name. That was after the much-married Henry dissolved the monasteries and the land passed into the hands of the Bedford family, whose town house was built on the south side. Behind the garden wall of my lord Bedford's house in 1656 a few purveyors of vegetables were allowed to vend their wares. They were the founders of Covent Garden

market. By Hogarth's days, as his picture of "Morning" shows, the salesmen of garden produce had spread all over the square.

And now there is no sight in all London more sought out by explorers of the byways of metropolitan life. Not that they are a numerous band; the fact that the Covent Garden day begins in the summer months soon after sunrise is sufficient to make them few and select. And, truth to tell, there is no room for many idlers. Long before the morning sun glints the roof of St. Paul's Church all the by-streets as well as the open space of the market are lined with vehicles and alive with sellers and buyers. Here are solid phalanxes of costermongers' barrows, farmers' wains, railway vans and green grocers' hooded wagons. Some are loaded sky-high, others empty. For this is the clearing house for London's daily supply of vegetables, fruits and flowers. For the lowly cabbage of the table of the artisan and the choice asparagus of an earl's banquet, for the cheapest of oranges and the costliest of grapes, for a penny bunch of violets or the rarest of hot-house blooms, this is the chief mart of all London.

Time was when the area drawn upon by Covent Garden was limited to a small radius. Chelsea sent celery, Charlton provided peas, Mortlake supplied asparagus, Battersea contributed cabbages and the Bedfordshire sands were responsible for onions. Burke used to grow carrots at Beaconsfield and bemoan the low prices he received.

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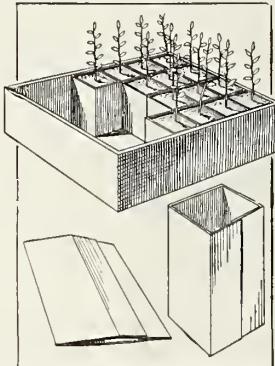
TWELVE SHIPPING STATIONS
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But even Beaconsfield was not far afIELD. Before the steel road was laid, in short, the stores of Covent Garden were restricted to such as could reach London by horse traction. Now, however, the iron horse hurries in the produce of the entire British Isles, swift steamers bring the harvests of the Channel Islands and France, and ocean greyhounds bear to this center the fruits of the ends of the earth. Railway vans jostle each other with baskets and crates packed with the produce of California and Australian orchards, and for their companions there are farmers' wains overflowing with vegetables that have traveled fewer yards than the fruits have miles. Little did those long-dead vendors of 1656 dream whereunto their modest merchandise would grow. Gone are the stalwart Irish women who used to handle bales of cabbages or baskets of potatoes with the ease of amazons; in their place is an army of husky porters, whose first duty is the unloading of railway vans and farmers' wains. On their heads, hardened by usage, they carry towering piles of crates or boxes or baskets to the stands of the various salesmen, and soon the business of the day is in full swing. First in evidence are the retail dealers from the best shops of all London; they can pay the highest prices and generally get the pick of everything. To them succeed the smaller shopkeepers or the most prosperous itinerant vendors; and last in the procession of buyers come the costermongers of mean streets. Of the latter there are several grades, ranging from the capitalist who owns several barrows and a team of donkeys to the hard-pressed East-endner who has had much ado to scrape together the four-pence for his barrow hire and an odd shilling or so to invest in stock in trade. The costermonger doesn't always get the leavings. He is an astute bargainer and understands the trust game to a limited extent. Rings are not unknown among those street vendors; they often pool their funds and buy in sufficiently large quantities to get the better of their rivals. So the bidders are plentiful, the auction brisk, and by the time London is beginning to stir from its sleep its day's supply of fruits, vegetables and flowers is streaming from Covent Garden to all points of the compass.

Even when the rush of the early hours is over the market is not destitute of attractions. Sufficient store of crated fruit is left to exhale that heavy odor of apples which Schiller loved so much that it was his chief inspiration in penning prose or verse; blending with that fragrance the nostrils can detect the more exotic pungency of pineapples or bananas; while the arcade reserved for plants in pots and cut flowers emits a wealth of mingled scents and dazzles the eyes with a kaleidoscope of bewildering color.

But the market is not all the interest of Covent Garden. The informed imagination grows busy in sweeping away salesmen's stalls, the fruiterers'

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avenues, the mounds of cabbages and cauliflower, the pyramids of baskets and crates and fills the vacant space with figures of long-past ages. This was a favorite dueling ground in the days of old London; the private letters and public records of the sixteenth and seventeenth centuries tell of many an "affair of honor" carried to fatal issue here; yonder, where the opera house stands, are the ghostly figures of Martha Ray and James Hackman, chief actors in the tragedy which robbed the Earl of Sandwich of his beautiful mistress and provided the town with a thrilling sensation. All around, too, are the shades of famous coffee houses, the Bedford, and King's, and Tom's. The first stood under the Piazza, and could count among its patrons Fielding, Pope, Sheridan, Churchill, Garrick, Foote, Quinn and Horace Walpole; the second, little more than an humble shed, stood beneath the portico of St. Paul's Church, which yet stands on the west side of the market, and can be easily repictured from Hogarth's "Morning." Will's and Button's coffee houses were close at hand, the former immortalized for all time by Macauley's glowing picture of the sparks and wits gathered in its smoke-laden room; the latter the haunt of Addison and Steele.

Although the original St. Paul's Church, save for the portico, was demolished by fire more than a century ago, the present building is an exact replica of the structure designed by Inigo Jones. "I don't want it much better than a barn," said the Earl of Bedford to Jones, who rejoined, "You shall have the handsomest barn in England." The building is nothing more than that, but the vaults beneath hold the dust of the parents of Turner and of the veteran Macklin, while in the churchyard, under nameless stones, repose the vitriolic Peter Pinder, the gay Wycherley, the nimble-witted Samuel Butler of "Hudibras" fame, the tuneful Dr. Arne, who gave England the music of "Rule Britannia," and the courtly Peter Lely, who perpetuated the frail beauties of the merry monarch's court. Round the corner is Henrietta Street, the one-time abode of Kitty Clive, Sir Robert Strange, the illustrious engraver, and Jane Austen when on her rare visits to town. But today the New World has invaded that famous thoroughfare, for where Pepys once took his strolls and Samuel Cooper painted his miniatures are the London establishments of the Duckworths and the Lippincotts.

The Northern Pacific Railway has issued a very beautiful book with handsome color page on "The Sixth Annual Rose Festival," to be held in Portland June 10 to 15. These booklets are being given a very wide distribution and copies can be secured at the Northern Pacific Railway offices.

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Economic Value of Birds for the Destruction of Insects

By William Watson Woollen

VEGETATION is the prime requisite for the perpetuity of all other forms of life upon the earth. Asa Gray, perhaps the greatest of American botanists, has well said, "Animals depend absolutely upon vegetables for their being. The great object for which the All-wise Creator established the vegetable kingdom is, that plants might stand on the surface of the earth between the mineral and animal creations, and organize portions of the former for the subsistence of the latter." The greatest known enemy to vegetation is insect life, whose almost innumerable species prey not only upon the necessities of mankind but upon man himself, and upon all other forms of life. Mr. J. A. Lintner, late entomologist of New York, estimates that there are now one million or more species of insects afflicting the world. Over three hundred thousand of these have been carefully described. Recently over two hundred thousand specimens of butterflies, no two alike, were presented to the United States Museum. There are pestiferous and destructive insects for every condition of life, place and plant about us. For instance, in the air, by day, we have flies, butterflies and winged ants, and at night moths, mosquitoes, bugs and beetles. Upon our shrubs and small fruits we have slugs, leaf hoppers, flea beetles, rose chafer, climbing cutworms and caterpillars. In our gardens we have cutworms, cabbage worms, root maggots, cucumber, pea and bean weevils and squash bugs. In our orchards we have borers, codling moths, bark lice, canker-worms and leaf caterpillars. In our meadows we have grasshoppers, cutworms, army worms, crane flies, white grubs and root borers. In our corn and wheat fields we have wire worms, ball worms, root worms, Hessian flies, ants and chinch bugs. In our forests we have plant lice, bark lice, trunk borers and leaf caterpillars. In our marshes, ponds and streams we have water beetles, water bugs, mosquitoes and May flies.

The fecundity of most insect forms is astounding, the numbers reaching such enormous proportions as to be almost beyond belief. Lintner once estimated the number of snow fleas on a small patch of country road near Albany, New York, to be greater than the entire human population of the world. Chinch bugs have been found in a small clump of bunchgrass eight inches in diameter to the number of twenty thousand. Fitch once computed the number of plant lice or aphids on a single cherry tree ten feet high to be twelve millions. Riley once computed that the hop aphis, developing thirteen generations in a single year, would, if unchecked to the end of the twelfth generation, have multiplied to the inconceivable number of ten sextillions of individuals. A Cana-

dian entomologist has determined that a single pair of Colorado beetles, without check, would multiply in one season to sixty millions of beetles. Kirkland has computed that one pair of gypsy moths, if unchecked, would produce enough progeny in eight years to destroy all the foliage in the United States; and Theodore Wood, in his book "Our Insect Enemies," says: "It may seem an extravagant and unjustifiable statement if we say that but for certain opposing agencies the aphis would overrun the entire world; that it would leave scarcely a green leaf upon the earth, and that it would cause such terrible devastation that all terrestrial life would wholly disappear and the globe become a vast desert incapable of supporting animation, and utterly without living beings. Still more impossible would it appear were we to state that this ruin and devastation would be the outcome, not of many centuries of gradual increase, but only of a few short months. Incredible as the assertion may seem, however, such results are no more than must logically follow if the aphis should be allowed to remain perfectly unmolested during the period of but a single year."

The voracity of insect life is as astonishing as its power of reproduction. Many caterpillars consume twice their weight in leaves per day, which corresponds to an ordinary horse eating a ton of hay daily. It is said "a certain flesh-eating larva consumes two hundred times its weight in twenty-four hours, a feat equal to a baby consuming fourteen hundred pounds of food." Some caterpillars increase in size ten thousand times in thirty days, corresponding to a man of eighty thousand pounds in weight. According to Trouvelet a single silk worm, in fifty-six days, will eat equal to eighty-six thousand times its original weight at hatching. If only one-hundredth part of the eggs laid by a silk worm moth could reach maturity a few years would witness enough silk worms to destroy all the American forests. The loss caused to the American farmers, gardeners and orchardists by noxious insects is appalling, if estimate made by those who have made the subject a careful study are to be relied upon. The damage caused by the Rocky Mountain locust from 1874 to 1877, known as the great grasshopper years, in Kansas, Nebraska and neighboring states approximated two

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hundred million dollars, and resulted in famine in many places. Lintner has estimated that the periodical damage by cutworms is greater than that of the Rocky Mountain locust. Mr. C. L. Marlatt calculates that the Hessian fly damage to the wheat crop in 1900 was one hundred million dollars, and in 1904 fifty million dollars more. The chinch bug, as early as 1864, damaged staple crops one hundred million dollars; and Mr. Riley placed the damage in Illinois alone at seventy-three million dollars. According to Riley the cotton worm claimed fifteen million dollars annually for fourteen years after the Civil War, or two hundred and ten million. Since 1880 the losses have been running between twenty-five million and fifty million dollars annually, and amounting to one billion one hundred and twenty-five million dollars more. Since 1863 the annual loss caused by noxious insects has increased from three hundred million dollars (Walsh) to eight hundred million dollars in 1904 (Marlatt). Finally, at this date, it is estimated that the insect and rodent pests of this country demand a tribute from the cultivated crops of one billion dollars or more each year, and still other millions are exacted from the forests, shrubbery and other exposed property of the land. These sums represent much more than the national debt of the United States and nearly twice the capitalization of all the national banks of the country.

Another pest with which man has to contend is the weeds. It is recorded that God said, "Cursed is the ground for my sake; in sorrow shall thou eat all the days of thy life; thorns, also thistles, shall it bring forth to thee; and thou shalt eat of the herb of the field; in the sweat of thy face shalt thou eat bread until thou return unto the ground." Since that record was made a great warfare has been waged in this world between good and evil, and this has been true not only in the world of morals but also in the vegetable world. By "thorns and thistles," as used in the quotation, thorny and prickly plants alone are not meant, but in a broader sense, all useless, noxious and troublesome plants are included. One only needs to count the seeds produced by a single plant of purslane, plantain, ragweed or cockle-bur to be convinced of the prodigious reproductive power of our common weeds. But for the warfare that is being waged against them by man and his allies the weeds would take possession of our gardens and fields, and we would be without bread. It may be that in that condition we, like the savages, could subsist upon wild fruits and the flesh of wild animals, and be able to clothe ourselves with their skins, but it would be impossible for us to live the lives of civilized beings under such conditions.

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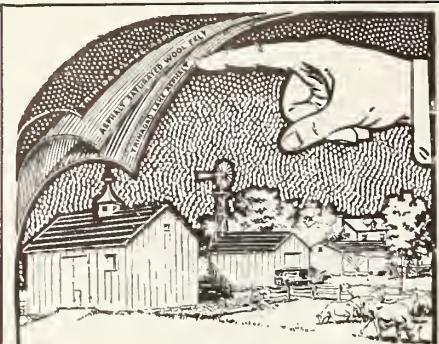
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space, and are gnawing animals. Rats, mice, woodchucks, rabbits, muskrats and beavers belong to this order. Every well informed person knows how rapidly these animals increase and how destructive they are to vegetation. In Australia the progeny of a few pairs of imported rabbits have overrun the country, its vegetation has been threatened with utter destruction and millions of dollars have been spent in the effort to get rid of the pest. And yet the warfare goes on. In this country, if not kept in check, they are among our most destructive pests, and especially is this so in our vineyards and orchards, where they do so much damage in girdling our vines and trees. Rats and mice are equally destructive.

These are startling and appalling statements, and they force the inquiry, what can we do to prevent this wholesale destruction of that which is essential to our very existence? The first and best answer to this question by those who have given serious consideration and thought to the matter is the protection of our birds. We have already seen that pestiferous insect pests are found everywhere doing their destructive work. It is just as true that we have the birds everywhere to hold these insect pests in check and to destroy them. In the air, by daylight, the swallows and swifts are coursing to and fro ever in pursuit of the insects found there, and which constitute their sole food. When they retire the night-hawks, whip-poor-wills and chuck-will's-widows take up the chase, catching moths and other nocturnal insects which would escape the day-flying birds. The flycatchers lie in wait, darting from ambush at the passing prey, and with a suggestive click of the bill return to their post for a renewed attack. The warblers, light, active creatures, flutter about the terminal foliage of our trees and shrubs, and with almost the skill of a hummingbird peck insects from leaf and blossom. The vireos patiently explore the under sides of the leaves and odd nooks and corners to see that no skulker escapes. The woodpecker, nuthatches and creepers attend to the tree trunks and limbs, examining carefully each inch of bark for insects, eggs and larvac, or excavating for the ants and borers they hear at work within. On the ground the hunt is continued by the thrushes, sparrows, meadow larks, bobolinks and other birds that feed upon the innumerable forms of terrestrial insects. This class of birds feed their young almost exclusively upon insects. Few places in which insects exist are neglected; even some species which spend their earlier stages in the water are preyed upon by aquatic birds.

The granivorous or grain-eating birds are those which par excellence are our weed destroyers. Of this class are our grosbeaks, finches, sparrows, juncos, towhees, tanagers, buntings, mourning doves, pheasants, bobwhites and others of like character. The shrikes, hawks and owls are in a class

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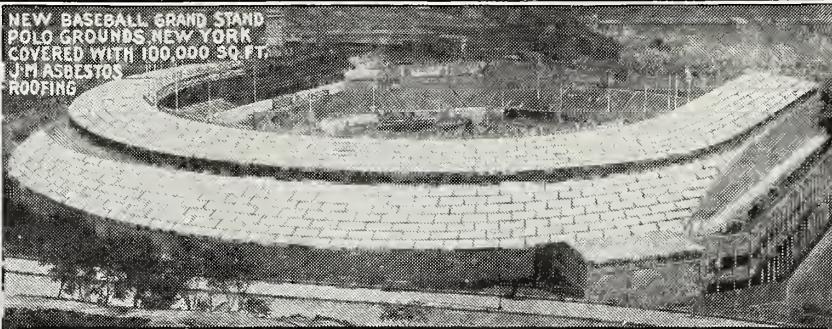
Whiter, Lighter
Bread

to themselves, and upon them we must rely for the destruction of the rodents and other vermin. Another useful class of birds are those which may be classed as scavengers, and upon whom we must depend for the removal and destruction of carrion and other waste material upon the land and sea. Of this class we have our house or English sparrows, gulls and vultures, and others of the same class. Such is a general statement of the economic value of our birds.

Idaho's 1911 Crop Smaller

While Idaho has become famous for its fruit and the phenomenal reclamation of fruit areas, with the result that millions of dollars have been realized to growers each year for fruit alone, 1911 was an off year, the fruit crop falling below that of last year. The best estimates obtainable give the crop this year as 2,000 cars, with a valuation of approximately \$2,000,000. State Horticultural Inspector McPherson states that he believes the estimates conservative, stating that there has been a falling off of the crop this year over last. Three years ago 70,000 acres of fruit had been planted. With the close of 1911 there are 120,000 acres set out to fruit, and the greater part of which is in bearing producing commercial fruit. Very little marketable fruit is raised in the eastern section of the state, although that section is capable of producing the more hardy fruits, and to the raising of grains, hay and potatoes. In the southwestern part of the state, or that section from Boise west and north to Weiser, including Nampa, Caldwell, Parma, Notus, Meridian, Middleton, Payette, Ontario, Nyssa, New Plymouth, Roswell, Weiser, Council, Cambridge, Emmett and other extensive fruit regions the fruit crop this year, as moved to the Eastern market and not counting the local consumption, was about 1,500 cars.

Lewiston, the home of the choicest of California grapes and a favored fruit section, shipped many cars of fruit to the Western and Eastern markets. The grape industry there is but fairly started, and within a few years it will become one of the most important of any in the state. There are about 120,000 acres of land planted to fruit in this state, over half of which is actually in bearing and the balance just reaching the age of bearing. Many thousands of acres of fruit were set out in 1911 and will become commercial bearing in from three to five years. The bearing fruit land is worth from \$300 to \$1,000 per acre and crops are certain. The more delicate fruits, as peaches and apricots, are being planted extensively.—Sand Point (Idaho) News.



The Largest Baseball Buildings in America are Covered with J-M ASBESTOS ROOFING

The importance of *fire-proof* construction was so vividly demonstrated to the owners of the baseball grandstand at the Polo Grounds in New York by the disastrous fire which destroyed their \$200,000.00 structure last year that they decided to take no chances of a repetition. They therefore built the new grandstand, shown above, of materials approved by the highest authorities on fire-proof construction—steel, concrete and J-M Asbestos Roofing.

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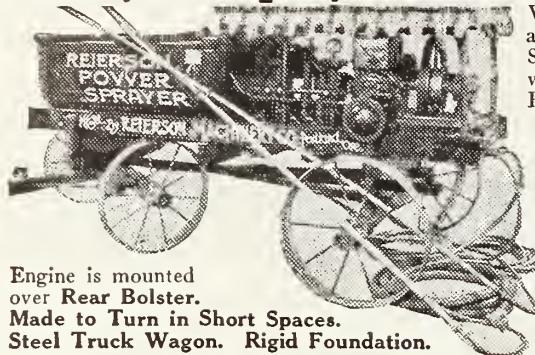
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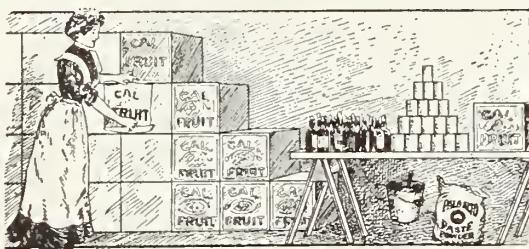
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Cellar Wintering Bees

By H. H. S.

ONE of the most difficult problems which confronts the average man who follows bee-keeping as the means of making his livelihood is the successful wintering of his bees. This applies particularly to those who are located in the more northerly regions where the winters are too long and severe to permit of wintering colonies on their summer stands. When it is remembered that their period of con-

finement extends over at least five consecutive months of the year the importance of having the conditions surrounding them as congenial as possible is obvious. Bees exist best under many of the conditions suitable to mankind, and perhaps if some of those who put colonies away in musty, badly ventilated cellars and other places were compelled to pass even a few of their hours of sleep under such conditions they would perhaps be the more inclined to give proper attention to the requirements of their bees, especially in view of the fact that any extra care and attention is sure to be repaid ten-fold by the little workers.

Let us first look into the condition of the colonies prior to entering winter quarters. Just as it is of the utmost importance that a person preparing for a trip to the Far North should lay in a necessary supply of food and clothing, so should the bees be prepared for their long sojourn through winter by having food in abundance and protection as regards warmth in the form of many of their kind, for, as the saying goes, "bees winter bees." Now, to bring about this populous condition of the hive prior to entering the cellar is often a difficult matter. Perhaps the most successful plan in vogue is that of introducing young and vigorous queens late in August, when the main honey flow is over and the then ruling queen has begun to curtail her laying powers. In this way a young queen has placed at her disposal a strong body of work-

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ers and she can lay to her full capacity without fear of their being neglected brood; and then, again, there is nothing to equal the average recently mated queen when it comes to laying out a hive. She will cover frame after frame with beautiful regularity as if revelling in the newly developed power. This means a splendid influx of young bees late in the fall to assist in carrying the colony through winter. A colony entering winter quarters with abundance of stores and consisting largely of young bees, with a young and vigorous queen at their head, will, provided other conditions are reasonably favorable, come out in splendid condition, and in the spring, on account of its superior strength, carry on brood rearing rapidly even during unfavor-

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able weather, which would cause a weak colony to dwindle away. Of course, one must not lose sight of the fact that extensive brood rearing late in the fall means a considerable consumption of honey and care must be taken to see that every colony has plenty of stores. One of the best schemes and simplest for fall feeding, to induce brood rearing when there is little honey coming in, is that of using inverted honey tins with a cover well perforated with holes about the size of a pin. If the tin is of the penny lever pattern so much the better, as when inverted over the frames the bees have free access to the entire surface on account of the formation of the lid. These feeders may remain on for days at a time and can be protected by a super and cover. There is little inducement for robbers to come around when feeding in this manner, as the syrup is completely shut in except to the bees from underneath and, of course, no scent can be had, which is the usual start of robbing when using open feeders.

Now that we have brought the hives up to a fairly prosperous condition by requeening and stimulative feeding where necessary, let us look into the question of their winter abode. Cement cellars are becoming more popular every year, and as an example the writer might mention one which is at present wintering 110 colonies. Its dimensions are 16x20, with a height of seven feet. The floor is concrete and the ceiling plastered. It is situated in a sandy hillside and the entrance way is on the lower side through a porch, which does away with a long flight of stairs and makes the moving of the hives much easier. During the winter, when the snow lies deep on the ground, this entrance is well covered and a trap door through the floor of the building above used when it is desired to visit the bees. The ventilation system consists of a six-inch tile pipe running under ground from the side of the hill for a distance of sixty feet and then rising in the center of the cellar floor. This is graded and acts as a drain as well as being the main source of air supply. There is another ventilator through the ceiling of the cellar and connecting with the room above. This is also of six-inch piping and is left entirely open to permit of the passage of the foul air arising from the bees. By the ventilator being protected from above in this manner there is no danger of the bees feeling the direct influence of outside conditions, nor of snow and rain coming in on them. The third ventilator enters the cellar at one end and about half way up the wall, and consists of a square box set in the cement and connected with a six-inch pipe running under ground for a distance of about ten feet and then upward. The box is faced with cotton to permit of slow ventilation without draft. The air passing underground such a short distance does not change much in temperature, and during the winter the thermometer often registers twenty degrees below zero

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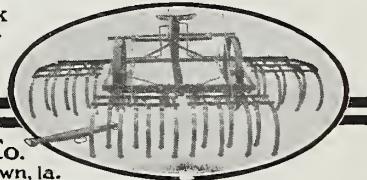
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depends upon the kind of nursery stock you get. If you are willing to pay a fair price you will get good trees. YOU CAN'T GET SOMETHING FOR NOTHING. If you expect to pay next-to-nothing and get good, first-class stock, you are mistaken, that's all. You can't produce a high quality tree for little or nothing any more than you can an axe, wagon, or any implement.

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Our sales this year could not have so largely surpassed last year's had we not made good in the past.

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Union Meat Co.'s Beef Scraps—60% Protein

Make your poultry grow faster and lay sooner than if fed only on vegetable matter and at a less proportionate cost. Send for further information—free upon receipt of name and address.

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When you are sick do you employ an inexperienced physician, or when in business troubles an attorney who has just been admitted to the bar? Then why, when the important step of planting a commercial orchard is contemplated, should you not use the same discretion and insist on getting trees that are grown right, propagated from trees that have proven their value and annually bear large crops of select prize-winning fruit?

The planting of an orchard is an epoch in your career, and before undertaking the work it is a good thing to make a careful investigation into the relative merits of the trees you intend to plant. Be sure that they are propagated from trees that are early, abundant and regular bearers of fancy fruit.

The mistake of an attorney may be corrected by court, those of the physician can be buried, but those of an orchard stand as lasting monuments of folly and reproach. THE CHARACTERISTICS OF THE PARENT TREE APPEAR AGAIN IN THE YOUNG TREE AND ITS FRUIT. In selecting the trees for your orchard choose those that have the money-making features and thereby assure certainty of results.

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5,000 Acres All in Apples

Over 3,000 acres of it has gone, mostly to Eastern people. The remainder will be gone by spring.

We plant and develop for five years, guaranteeing to turn over to you a full set, perfectly conditioned commercial orchard. After the expiration of the five years we will continue the care of your orchard for you, if desired, for actual cost, plus 10 per cent.

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outside and forty degrees in the cellar, the cotton preventing the cold air from entering too rapidly. This question of cotton as protector and at the same time ventilator in winter is one in which the writer believes there are great possibilities.

The time for setting away "to be bees" most advantageously is worthy of consideration. Many make a practice of leaving their colonies on the summer stands as late as possible in the fall in order to shorten their period in the cellar, but there is good reason to doubt the wisdom of their doing this. In the first place they are going to be subject to all sorts and conditions of weather, with cold rains and snow and many nights of heavy frost, conditions which are certainly going to cause the bees to make heavy inroads in their stores and, to cap the climax, they may finally have to be put away for the winter after being confined to the hives for a long time without having had a cleansing flight. During this period of cold weather they have been obliged to eat more honey than usual in order to keep up the heat of the cluster, and as a natural consequence their bodies are distended with feces. This is a very undesirable condition in which to begin their long winter rest, and they are handicapped at the outset in a way that is likely to prove disastrous. Would it not have been better to have had those bees stored away in the cellar where an even temperature surrounded them, perhaps a little high at first, but not one which would cause over feeding. It is not hard to find a day about the end of October or early in November, following a heavy frost at night which in its turn has just been preceded by a spell of fine weather when the bees have flown freely. Here one has the ideal conditions. The frosty night has driven the bees well in and up on the combs and the handling of them, in so far as closing the entrances and removing covers, etc., is rendered comparatively easy. The preceding fine weather has prevented any accumulation of feces and they enter the long period of confinement in a state which, so far as we can suppose, will be conducive of the very best results. The entrances to the hives may be closed with tissue paper such as is purchased in rolls. This is very well suited to the purpose and inexpensive, and every hive can be closed before any are moved, which is advisable if the day promises to be warm enough for the bees to fly. Some days before the final move it would be well to go around to each hive and place a fresh quilt of canvas or heavy duck over the frames, making sure that it is a good fit. By placing the quilts on late in the fall the bees do not have time to propolize them sufficiently to prevent of ventilation through the cloth, a condition which cannot be obtained by leaving on the old quilts, which are sure to be plastered with propolis. In addition the hives are neater and pack more readily in the cellar if you are limited for space. When all the hives are in on the racks the doors should be closed to prevent

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The famous Piedmont section of Virginia, fifth apple growing state in the Union. Some of these orchards cultivated, others young trees. Some not cultivated. Prices range \$10, \$15, \$20, \$25 per acre and up. All varieties thrive. Albemarle Pippins, York Imperials, Grimes Golden, Winesap, Ben Davis, etc. All varieties peaches. Close markets, ideal climate, evenly distributed rainfall, plenty sunshine, low freight rates, high prices for products. Unexcelled educational facilities. The place to make your home. Write today for booklet. Address Dept. 14

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Salesmen wanted. Easy to sell our trees.

any daylight entering, and with the aid of a candle the paper in the entrances should be removed as quickly as possible and the bees left to settle down. Bloeks may then be inserted at either corner of the front to raise the hive off the bottom board, and in that way give the bees plenty of air. In order that the hives may easily be raised off the front end of the bottom it is important to see that previous to moving all staples or hooks are loosened, as it is almost impossible to do this kind of work after they are put away.

Missouri Apple Prices

The Missouri State Board of Horticulture is now in possession of sufficient data to warrant the publication of a statement regarding the prices received for the past season's apple crop. The figures following are based upon reports received from several hundred correspondents, who are fruit growers, each of whom reported for his own orchard. In order to maintain uniform conditions the cost of the package, when furnished by the grower, has been deducted:

	Cents
Average price per bushel on trees.....	42.5
Average price per bushel delivered.....	57.2
Average price per bushel from storage (cost of storage included).....	98.3
Average price per bushel by the bushel.....	67
Average price per bushel by the barrel.....	58.5
Average price per bushel by the cwt.....	38.7
Sprayed, average price per bushel.....	61.7
Unsprayed, average price per bushel.....	49.3
Graded, average price per bushel.....	62.7
Orchard run, average price per bushel.....	43.4
<i>Per cent</i>	
Orchards reported sprayed	37
Orchards reporting fruit unfit for market, due to disease and insects.....	2.5
Orchards reporting no crop (no cause given)	12
Orchards reporting no sale, due to lack of buyers	1

Of the growers reporting as having sprayed fifty per cent sprayed twice, twenty-five per cent sprayed three times, and of the others some sprayed once, others three and four times and one eight times. Perhaps the two most important facts contained in the above figures are: (1) The increase of 12.4 cents per bushel received for sprayed over unsprayed fruit, and (2) the failure of 2.5 per cent of the orchards to produce salable fruit due to ravages of disease and insects. Now, if to the above we add the fact, proven by experiment, that spraying increases the yield of merchantable fruit an average of two to three bushels per tree in orchards ten to twenty years old, also the extra cost of picking and sorting where the per cent of good fruit runs low, it becomes apparent that spraying as an orchard practice is very profitable, indeed.—W. W. Chenoweth, secretary.

Almost the whole world knows of Hood River as a place that produces the best fruits, and all of Hood River Valley should know, and could know, that there is one place in Hood River, under the firm name of R. B. Bragg & Co., where the people can depend on getting most reliable dry goods, clothing, shoes and groceries at the most reasonable prices that are possible. Try it.

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Will Pay for Itself in Less Than Three Weeks. Operated by One Man.

Neat, Compact, Simple, Strong, Light, Durable

The 4 h. p. Waterloo Boy engine is a separate unit. Can be removed at any time and put to a hundred uses.



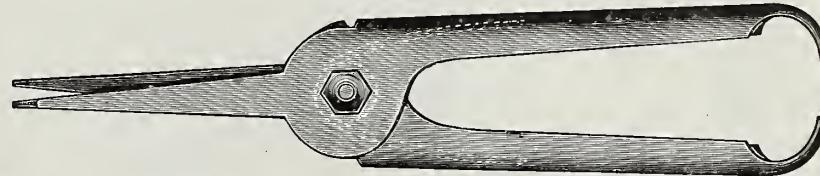
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Will saw 20 to 40 cords of wood per day at a cost of \$1. PULLS ITSELF up hill or down. Costs 15 per cent less than other makes not as good. There's more you ought to know.

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SOLE MANUFACTURERS



Fruit Thinning Shears Improved Pattern

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40 cents each, \$3.90 per dozen, postpaid

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with an outfit that you can use all the year means dollars to you. Here is a triple-duty outfit for the price of a single rig.

Engine is Simplest, Most Powerful Made
Connected to powerful spray pump by patent jack, with clutch movement, and operates without cranking; thoroughly reliable.

Pump and Engine Can Be Removed From Truck in 4 Minutes
and is instantly available for other work. The clutch allows you to use the engine for any other duty.

Price includes tank wagon with shafts, agitator, high-duty spray pump, gauge, relief valve, hose, two extensions, two nozzles, strainer, clutch, patent pump jack, and engine with complete equipment. All mounted, ready to run. For full particulars, send for Bulletin 501

DETROIT, MICH.

Dull Ax sharpened in 3 Minutes

"It took just 3 minutes to put a very dull ax in perfect shape," writes J. W. Suddard, Newark, Del.—Another letter says: "My ten year old boy ground several chilled plowshares—he sharpens all the tools on the place," writes J. O. Smith, Woodville, Ky.

Over one-half million farmers know this to be true and sharpen their sickles, discs and all farm tools with the **Luther Farm Tool Grinder**.

It is a wonderful tool grinder—the only all steel frame grinder made—has shaft drive like an automobile—enclosed bearings—gravity lubrication. Has 30 different attachments for doing all kinds of difficult tool sharpening, also rip saw, jig saw, drill, milk tester attachment, lathe, forge, etc.

Fast Sharpening Wheels Save Time. Luther Tool Grinders have Dimo-Grit sharpening wheels, 25 times faster than grindstone—10 times more efficient than emery. Will not draw temper.

FREE TRIAL ON YOUR FARM

Send for special offer which permits you to use this outfit on your farm 30 days free without advance payment; also 40 page book which tells everything and hundreds of letters from satisfied users.

LUTHER GRINDER MFG. CO., 1168 Stroh Bldg., Milwaukee, Wis.

There's BIG Money in Wood Sawing

Owners of the Reerson Wood Saw make \$10 to \$20 per day right along



A Practical, Durable, Efficient Machine, priced within your reach. Equipped with 6 h. p., frost proof, water cooled, Waterloo Boy Gas Engine. Selby anti-friction roller steel saw table. Wide tired steel or wood wheels for rocky roads and stone pavements. Heavy, machine turned fly wheels for arbor mounted so the engine fly wheels straddle the frame, thereby overcoming top heaviness.

Positively the best wood saw made—stands every test. A great money maker. Write today for full description and prices. Ask for catalog W 6

Reerson Machinery Co. 182-6 Morrison Street Portland, Oregon

Varieties for Commercial Apple Orchards

By E. F. Stephens, Nampa, Idaho

THE history of our commercial orchards of the whole United States shows that in the earlier plantings there was a great amount of guess work and experiment. People planted the varieties which they were able to get or which pleased them in the state from which they came. These varieties were then tried out and their adaptation, or lack of it, to the conditions where planted ultimately developed. This has been peculiarly true in the planting of the older orchards of Southern Idaho. We find, in studying their behavior, that some varieties yield but little more than half of the number

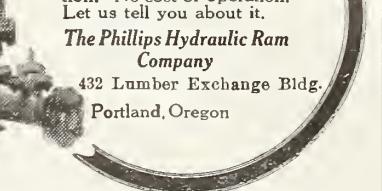
of boxes per tree produced by other varieties, and the selling value on the market varies widely. As an illustration of this question we note the orchard of B. F. Tussing at Fruitland, in the Payette district, Idaho. This orchard of eight acres was planted some thirteen years ago. We have a carefully compiled and correct statement of the fruit crop of the year 1910. This statement shows that one hundred Jonathan trees produced nineteen and a half boxes of commercially packed apples per tree. One hundred and seventy-six Rome Beauty trees produced almost twenty boxes per tree. On the other hand, the Oregon Reds produced only twelve and a half boxes per tree; the Ben Davis twelve boxes per tree; the Delaware Red a little less than ten and a half boxes per tree; the Arkansas Black thirteen and a half boxes per tree. Note that Jonathan and Rome Beauty yielded fully eighty to ninety per cent more boxes per tree than the Delaware Red or the Ben Davis. Note also that the Jonathan and the Rome Beauty gave a much higher percentage of extra fancy fruit, salable at higher prices, than some of the varieties less favorably known.

Water

Pump it automatically with a Phillips Ram. No attention. No cost of operation. Let us tell you about it.

The Phillips Hydraulic Ram Company

432 Lumber Exchange Bldg.
Portland, Oregon



Now, this is a matter of supreme importance in the planting of the commercial orchard. The combined experience of twelve to fifteen years has shown that in the Hood River district their soil, climate and conditions specially favor the Newtown Pippin and the Spitzenberg. As these two varieties do not inter-pollinate each other with the best success the Ortley is sometimes planted with them for that purpose. In the Boise basin and Payette district soil and climatic conditions specially favor the production of Jonathan, Rome Beauty, Grimes Golden, of superior quality. The Winesap bears very abundantly, but does not attain quite the size as grown in the Boise basin and Payette district that the Winesap attains as grown in the Chelan, Wenatchee and Yakima districts in Washington. The Winesap is,

FORGED DISK BLADES

There is as much difference in the quality of the material used in the blades of disk harrows as there is in pocket knives. Some knives are made to sell at ten cents and others at a dollar. Many disk blades belong to the ten cent pocket knife class, but are worked off on buyers with the rest of the machine at the same price for which the best are sold. Consequently, the farmer cannot be guided by price.

The Cutaway Harrow Co. has built its remarkable reputation largely by the quality of the disks on its tools. It has had a real sincere ambition to give to the farmer the best disk blade he could buy. Their motive for so doing has been as much one of pride as of profit. The latter came because the policy of high quality paid.

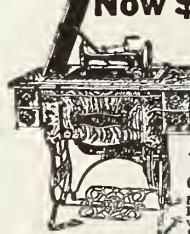
Their one object has been constantly in view—the best blade possible. To accomplish that, forging the edges became a part of the process. Now all Cutaway Harrow Co.'s disk blades are forged. If you don't fully realize the advantage of forging, ask your blacksmith why a forged edge is better than any other. He will tell you why no other method is so good. This forged edge feature shows how the Cutaway Harrow Co. is doing the things necessary to produce the best tools. It is an indication of merit throughout every tool they make. Every buyer should demand Cutaway forged disks. They cost no more, and are many times better. If you will write them at 940 Main St., Higganum, Conn., they will send you complete information on the construction of Cutaway machines. It would pay every farmer to give them his ear. Write a post card today.

MICHELL, LEWIS & STAVER CO.
Western Agents
PORTLAND, OREGON



The edge is forged, not rolled and ground.

The Genuine **DOMESTIC**
Now \$**2** A MONTH



You can place the latest model, genuine Domestic, the one of a kind sewing machine, in your home, use it continually while paying \$2 a month, and enjoy a very special price direct to you or from our nearest agency. A magnificent machine—a stupendous offer.

We Will Take Your Old Machine if you wish a liberal allowance on a new Domestic. And you can still take advantage of the special price and easy terms.

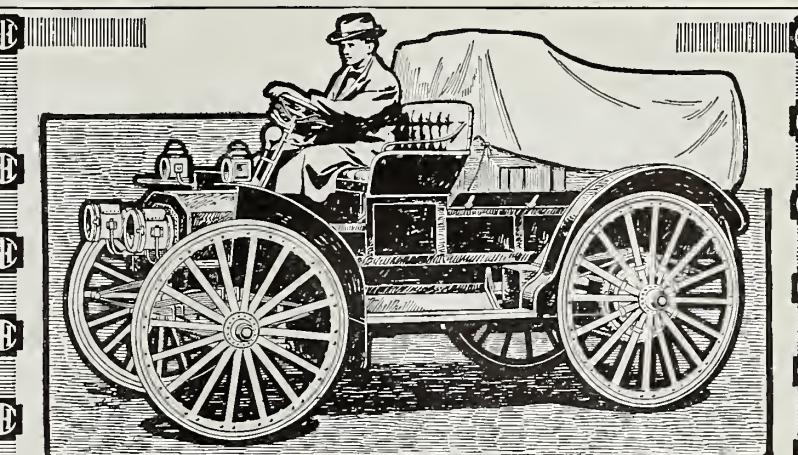
DOMESTIC

The perfect sewing machine that has always led all other makes and is today better than ever. Two machines in one—lock stitch and chain stitch. Straight drop-head, high arm, ball bearing. A complete set of attachments—every one practical, etc., made for every-day use. The Domestic is a revelation of modern sewing machine progress. Find out about it. **SEND FOR BOOK, FREE.** The Truth About Sewing Machines, telling you how you can buy the best sewing machine at a low price. Let us send you \$2 a month. Learn why we sell direct where we have no agent and give you a 25 YEAR GUARANTEE. Get the facts before you buy any machine. This Free Literature will save you money. Send for it NOW. Domestic Sewing Machine Co., 48 Jackson Blvd., Dept. 414 Chicago.

however, exceedingly productive, and properly thinned is a valuable variety for the Boise and Payette districts. The Delicious, the Winter Banana, the White Winter Pearmain and the King David are being planted and tested in a small way, and we shall know more about them in the near future.

Referring again to the carefully compiled statement of the behavior of the orchard owned by B. F. Tussing we find that although his orchard contained at least three varieties that ought not to have been planted, yet the yield was 1,209 boxes per acre, five-eighths of the entire product of which sold as extra fancy. Note that in the expense account against this orchard there first appears eight per cent interest on the valuation of fifteen hundred dollars per acre; one hundred and twenty dollars per acre interest account, or ten cents a box on the apples grown. Note that the expense of pruning, hauling out brush, cultivating, thinning, spraying, irrigation, taxes, supporting branches of trees by props, water assessments and repairing fences amounted to almost exactly six cents per box; that the cost of purchasing the boxes, making the same, paper, sorting, wrapping, packing, nailing the boxes and help in the packing house, hauling from orchard to packing house, hauling to cars, loading and bracing amounted to thirty-two cents a box, making the total cost of the production of the crop forty-eight cents per box. It should be borne in mind, however, that this includes ten cents per box interest charge of eight per cent, the valuation of fifteen hundred dollars per acre, and as Mr. Tussing owns the land this one hundred and twenty dollars per acre of interest charge was really a part of his income. From this standpoint his net income per acre, after paying all the other expenses save interest, was nine hundred and ninety-six dollars per acre. Now, if this is possible in an orchard where some of the varieties were not merchantable at the better prices, or not sufficiently productive, what can be done in the orchards which are being planted at this moment, using only varieties adapted to our soil and climate and varieties which develop the highest percentage of extra fancy fruit? Sound business judgment would indicate the supreme importance of planting a very narrow list of varieties, and those the very best and most profitable for the particular district where planted.

The following is a carefully prepared statement showing the cost of growing apples in this district, or neighborhood, of Southern Idaho. Please note that he charges the expense account with eight per cent interest on the \$1,500 valuation, or \$120 interest account. Add this \$120 to \$876 per acre, the net profit per acre, and you have \$996 per acre as the net return from this orchard. Two weeks ago I visited the Manville and Jurst orchard, near Boise, Idaho, and there I found that in the season of 1911 they had picked sixty-two and sixty-three boxes of apples, orchard



Hours Are Dollars—Save Them

WITH an International auto wagon, you can do all your road work and light hauling in one-half the time, and at less cost than with horses. You can save hours in taking your produce to the market or railroad station—save hours in going to mill or creamery.

It Will Pay You

to keep your horses in the field and have an International auto wagon do your road work. It is always ready, winter or summer, rain or shine. Sand, steep hills, snow, and mud are no obstacles. It is built to meet these conditions, and it does. With the addition of an extra seat and top, the International auto wagon is converted into a comfortable and roomy pleasure vehicle.

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International Harvester Company of America

(Incorporated)

115 Harvester Building Chicago U.S.A.

IHC Service Bureau

The purpose of this Bureau is to furnish, free of charge to all, the best information obtainable on better farming. If you have any worthy questions concerning soils, crops, land drainage, irrigation, fertilizer, etc., make your inquiries specific and send them to IHC Service Bureau, Harvester Building, Chicago, U. S. A.



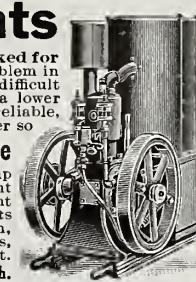
Detroit Irrigation Plants

are the best that money can buy. Sold at lower prices than are asked for inferior plants. No more irrigation troubles! We have solved the problem in a way that is at once the most satisfactory and economical. No matter how difficult your installation may be, we can fit you out with a better outfit at a lower price than you can get elsewhere. You MUST have a thoroughly reliable, strong, simple and economical engine, and there is none other so efficient as the

AMAZING DETROIT Kerosene Engine

in combination with just exactly the right pump adjusted and arranged in just exactly the right manner for your particular work. If you want advice as to how to proceed to get the best results with the least investment and cost of operation, write us at once, giving full and complete details, addressing your letter to our Irrigation Specialist.

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and district to
ride and ex-

hibit a sample 1912 Model "Ranger" bicycle furnished by us. Our agents everywhere are making money fast. Write at once for full particulars and special offer.

NO MONEY REQUIRED until you receive and approve of your bicycle. We ship to anyone, anywhere in the U. S. without a cent deposit in advance, prepay freight, and allow **TEN DAYS' FREE TRIAL** during which time you may ride the bicycle and put it to any test you wish. If you are then not perfectly satisfied or do not wish to keep the bicycle you may ship it back to us at our expense and you will not be out one cent.

LOW FACTORY PRICES We furnish the highest grade bicycles at one small profit above actual factory cost. You save \$10 to \$25 middlemen's profits by buying direct of us and have the manufacturer's guarantee behind your bicycle. **DO NOT BUY** a bicycle or pair of tires from anyone at any price until you receive our catalogues and learn our unheard of factory prices and remarkable special offer.

YOU WILL BE ASTONISHED when you receive our beautiful catalogue and study our superb models at the wonderful low prices we can make you. We sell the highest grade bicycles at lower prices than any other factory. We are satisfied with \$1.00 profit above factory cost. **BICYCLE DEALERS**, you can sell our bicycles under your own name plate at double our prices. Orders filled the day received.

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MEAD CYCLE CO. Dept. L345 **CHICAGO, ILL.**



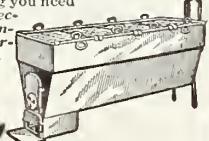
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It fully explains how to make big profits from your entire fruit and vegetable crops with my *Stahl Portable Canning Outfit*. There is an ever increasing demand for good, home-made canned fruits and vegetables—right in your own locality. Why not have this big profit, not be derived from any other source?

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Each one a complete home canning factory, varying only in capacity. Costs but little to buy—big money-maker from the start. Anyone can run a *Stahl Portable Canning Outfit*. No experience necessary. I supply everything you need including *My Special Directions which contains formulas for canning the different fruits and vegetables*. Write for my big free Canning Book today.

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IMPROVED STANDARD DRILLING MACHINE
One Man Can Handle
Has a record of drilling 130 feet and driving casing in one day. Only three men required. Extra large rope sheaves. Positively will drill every kind of formation. Avoid delays from sending back East. Buy from us. We build these up-to-date machines. Will tell you all in catalog. Write for it.

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The Standard

Starts Gas Engines and Runs Cheaper than Batteries
Saves 10% cost over and over again. It not only doubles the efficiency of gasoline, Marine, Portable and Gas Tractor Engines. Produces current for ignition, electric lights and charging storage batteries. Water and dust proof. Sold on Trial. Guaranteed. Write for free catalog.
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RATS, MOLES, SQUIRRELS. A 10-year old boy can do it with this "CINCH" TRAP



No gun, no poison, no bait. Absolutely safe. Made entirely of steel. Guaranteed. Your money back if it's not the best trap you ever saw or heard of.

TRIAL TRAP SENT POST PAID TO YOU FOR \$1.00 BY
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Use KEROSENE Engine Free!

Amazing "DETROIT" Kerosene Engine shipped on 15 days' FREE Trial, proves kerosene cheapest, safest, most powerful fuel. If satisfied, pay lowest price ever given on reliable farm engine; if not, pay nothing. No waste, no evaporation, no explosion from coal oil.

Gasoline Going Up!
Gasoline is 9cts to 15cts higher than coal oil. Still going up. Two pints of coal oil will do work of three pints gasoline.

Amazing "DETROIT"
—only engine running on coal oil successfully; uses alcohol, gasoline and benzine, too. Starts without cranking. Only three moving parts—no cams—no sprockets—no gears—no valves—the utmost in simplicity, power and strength. Mounted on skids. All sizes, 2 to 20 h. p., in stock ready to ship. Engine tested before crating. Comes all ready to run. Pumps, saws, threshers, churms, separates milk, grinds feed, shells corn, runs home electric lighting plant. Prices (stripped) \$29.50 np. Sent any place on 15 days' Free Trial. Don't buy an engine till you investigate money-saving, power-saving "DETROIT." Thousands in use. Costs only postal to find out. If you are first in your neighborhood to write, you get Special Extra-Low Introductory price. Write (138)
Detroit Engine Works, 507 Bellevue Ave., Detroit, Mich.

BETTER FRUIT

run, for trees sixteen years planted. Trees that had yielded fifty boxes were quite frequently met with, others forty boxes, and so on down. Note the particularity of detail in this statement of growth of 1911 and what was received therefrom:

STATEMENT OF 1910 FRUIT CROP
From eight acres of orchard owned by B. F. Tussing, Fruitland, Idaho

Varieties	Number Trees	Boxes Produced
Jonathan	100	1,936
Rome Beauty	176	3,503
White Winter Pearmain	47	780
Mammoth Black Twig	18	371
Oregon Red	12	151
Ben Davis	4	48
Delaware Red	13	135
Gravenstein	15	291
Arkansas Black	180	2,130
Totals, on eight acres..	565	9,668

Grades	Number Boxes	Price Received
Extra fancy	1,6,048	\$8,161.80
Fancy	2,310	2,511.00
Choice	1,319	1,050.75

Totals 9,678 \$11,756.65

Average per acre, 1,209 boxes, \$1,460.57.

Expense account to be deducted from the above as follows:

Harvesting	Per Box
Boxing, and making boxes.....	\$0.13
Packing .....	.05
Sorting .....	.02
Paper .....	.02
Nailing boxes, help in packing house.	.03
Hauling to cars, loading and bracing.	.02
Hauling, orchard to packing house...	.01
Picking .....	.01
Total	\$0.32

Orchard Expenses	
Interest on investment.....	\$960.00
Pruning and hauling brush.....	160.00
Cultivating	96.00
Thinning fruit	95.00
Spraying	80.00
Irrigation	18.00
Taxes	14.00
Propping trees	10.00
Water assessment	11.00
Repairing fences	8.00
Total	\$1,15.00

Orchard expense, per box.....	\$0.16
Harvesting expense, per box.....	.32

Total cost of production, per box. \$0.48

Gross returns, eight acres..... \$11,756.65

Cost of production..... 4,745.41

Net balance, eight acres..... \$7,011.11

Plans are already actively under way for the Second Indiana Apple Show, to be held November 4 to 9, 1912. The unqualified success of the 1911 show—the first ever held—has been a decided impetus to the horticultural revival which has been taking place in the hoosier state during the last two or three years. The apple show commission has organized with the same officers as last year, as follows: E. R. Smith, Indianapolis, president; C. N. Lindley, president of the Indiana Horticultural Society, Salem, Indiana, vice-president; Dr. H. E. Barnard, state food and drug commissioner, Indianapolis, superintendent; Hon. Joseph M. Cravens, Madison, treasurer; C. G. Woodbury, head of department of horticulture Purdue University, Lafayette, secretary. The show management is promising a premium list which will go ahead of the \$3,000 in gold awarded at the 1911 show. Indiana fruitgrowers are advised to begin preparations at once for growing the right kind of exhibition fruit. Remember the date, November 4 to 9, 1912.

1000% Returns From

the use of a Hercules Stump Puller. Bumper crops instead of stumps. Big money in place of taxes. \$1,200 from 40 acres the first year—\$750 in extra crops every year after. Get the catalog of the

Hercules

Genuine Steel Stump Puller

You can clear an acre of stumps a day. 30 days' free trial. Guaranteed 3 years. Special introductory price proposition. Write today for big free catalog.

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From Iowa

Ryan & Newton Company

Wholesale Fruits and Produce

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We have modern cold storage facilities essential for the handling of your products

Reliable Market Reports

PROMPT CASH RETURNS

RIFE RAMS

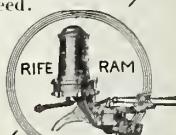
Water in Your Orchard

or fruit patch saves time and labor. Get all you need from an automatic Rife Ram.

Costs little to install—nothing to operate. Raises water 30 feet for every foot of fall. Land lying above canal or stream supplied with water. Pumps automatically day and night, winter and summer. Fully guaranteed.

If there is a stream, pond or spring within a mile write for plans, book and trial offer, free.

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Monarch Hydraulic Cider Press Write for it today
—all sizes—guaranteed strength and power. Also Gasoline and Steam Engines, Threshers, Saw Mills.
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Northwest Fruit Growers' Unions and Associations

We publish free in this column the name of any fruitgrowers' organization. Secretaries are requested to furnish particulars for publication.

Oregon

Eugene Fruit Growers' Association, Eugene; Ashland Fruit and Produce Association, Ashland; Hood River Apple Growers' Union, Hood River; Milton Fruit Growers' Union, Milton; Douglas County Fruit Growers' Association, Roseburg; Willamette Valley Prune Association, Salem; Mosier Fruit Growers' Association, Mosier; The Dalles Fruit Growers' Union, The Dalles; Salem Fruit Union, Salem; Albany Fruit Growers' Union, Albany; Coos Bay Fruit Growers' Association, Marshfield; Estacada Fruit Growers' Association, Estacada; Umpqua Valley Fruit Growers' Association, Roseburg; Hyland Fruit Growers of Yamhill County, Sheridan; Newburg Apple Growers' Association, Newburg; Dufur Valley Fruit Growers' Union, Dufur; McMinnville Fruit Growers' Association, McMinnville; Coquille Valley Fruit Growers' Union, Myrtle Point; Stanfield Fruit Growers' Association, Stanfield; Oregon City Fruit and Produce Association, Oregon City; Lincoln County Fruit Growers' Union, Toledo; Rogue River Fruit and Produce Association, Medford; Mount Hood Fruit Growers' Association, Sandy; Northeast Gaston Farmers' Association, Forest Grove; Dallas Fruit Growers' Association, Dallas; Northwest Fruit Exchange, Portland; Springbrook Fruit Growers' Union, Springbrook; Cove Fruit Growers' Association, Cove; Santiam Fruit Growers' Association, Lebanon; Washington County Fruit Growers' Association, Hillsboro; Benton County Fruit Growers' Association, Corvallis; Sutherlin Fruit Growers' Association, Sutherlin; Brownsburg Fruit and Produce Association, Brownsburg; La Grande Fruit Association, La Grande.

Washington

Kennewick Fruit Growers' Association, Kennewick; Wenatchee Fruit Growers' Union, Wenatchee; Puyallup and Sumner Fruit Growers' Association, Puyallup; Vashon Island Fruit Growers' Association, Vashon; Mt. Vernon Fruit Growers' Association, Mt. Vernon; White Salmon Fruit Growers' Union, White Salmon; Thurston County Fruit Growers' Union, Tumwater; Bay Island Fruit Growers' Association, Tacoma; Yakima Valley Fruit and Produce Growers' Association, Granger; Buckley Fruit Growers' Association, Buckley; Lewis River Fruit Growers' Union, Woodland; Yakima County Horticultural Union, North Yakima; White River Valley Fruit and Berry Growers' Association, Kent; Lake Chelan Fruit Growers' Association, Chelan; Zillah Fruit Growers' Association, Toppenish; Kiona Fruit Growers' Union, Kiona; Mason County Fruit Growers' Association, Shelton; Clarkston Fruit Growers' Association, Clarkston; Walla Walla Fruit and Vegetable Union, Walla Walla; The Ridgefield Fruit Growers' Association, Ridgefield; Felida Prune Growers' Association, Vancouver; Grandview Fruit Growers' Association, Grandview; Yakima Valley Fruit Growers' Association, North Yakima; Southwest Washington Fruit Growers' Association, Chehalis; The Touchet Valley Fruit and Produce Union, Dayton; Lewis County Fruit Growers' Association, Centralia; The Green Bluffs Fruit Growers' Association, Mead; Garfield Fruit Growers' Union, Garfield; Goldendale Fruit and Produce Association, Goldendale; Spokane Inland Fruit Growers' Association, Keisling; Elma Fruit and Produce Association, Elma; Granger Fruit Growers' Association, Granger; Cashmere Fruit Growers' Union, Cashmere; Stevens County Fruit Growers' Union, Myers Falls; Dryden Fruit Growers' Union, Dryden; Apple Growers' Union of White Salmon, Underwood; Spokane Valley Growers' Union, Spokane; Spokane County Horticultural Society, Spokane; Spokane Highlands Fruit Growers' Association, Chester; Spokane District Fruit Growers' Association, Spokane.

Idaho

Southern Idaho Fruit Shippers' Association, Boise; New Plymouth Fruit Growers' Association, New Plymouth; Payette Valley Apple Growers' Union, Payette; Parma-Roswell Fruit Growers' Association, Parma; Weiser Fruit and Produce Growers' Association, Weiser; Council Valley Fruit Growers' Association, Nampa; Lewiston Orchard Producers' Association, Lewiston; Boise Valley Fruit Growers' Association, Boise; Caldwell Fruit Growers' Association, Caldwell; Emmett Fruit Growers' Association, Emmett; Twin Falls Fruit Growers' Association, Twin Falls; Weiser River Fruit Growers' Association, Weiser; Fruit Growers' Association, Moscow.

Colorado

San Juan Fruit and Produce Growers' Association, Durango; Fremont County Fruit Growers' Association, Canon City; Rocky Ford Melon Growers' Association, Rocky Ford; Plateau and Debeque Fruit, Honey and

Produce Association, Debeque; The Producers' Association, Debeque; Surface Creek Fruit Growers' Association, Austin; Longmont Produce Exchange, Longmont; Manzanola Fruit Association, Manzanola; Delta County Fruit Growers' Association, Delta; Boulder County Fruit Growers' Association, Boulder; Fort Collins Beet Growers' Association, Fort Collins; La Junta Melon and Produce Company, La Junta; Rifle Fruit and Produce Association, Rifle; North Fork Fruit Growers' Association, Paonia; Fruita Fruit and Produce Association, Fruita; Grand Junction Fruit Growers' Association, Clifton, Palisade, Grand Junction; Palisade Fruit Growers' Association, Palisade; Colorado Fruit and Commercial Company, Grand Junction; Montrose Fruit and Produce Association, Montrose; Hotchkiss Fruit Growers' Association, Hotchkiss; Paonia Fruit Exchange, Paonia; Colorado Fruit Growers' Association, Delta; Crawford Fruit Growers' Association, Crawford; Amity Cantaloupe Growers' Association, Amity; Bent County Melon Growers' Association, Las Animas; Capitol Hill Melon Growers' Association, Rocky Ford; Denver Fruit and Vegetable Association, Denver; Fair Mount Melon Growers' Association, Swink; Fowler Melon Growers' Association, Fowler; Granada Melon Growers' Association, Granada; Grand Valley Fruit and Produce Association, Grand Junction; Independent Fruit Growers' Association, Grand Junction; Kouns Party Cantaloupe Growers' Association, Rocky Ford; Lamar Melon Growers' Association, Lamar; Loveland Fruit Growers' Association, Loveland; Manzanola Orchard Association, Manzanola; Newdale Melon Growers' Association, Swink; Roaring Fork Potato Growers' Association, Carbondale; Woods Melon Growers' Association, Las Animas; Western Slope Fruit Growers' Association, Palisade.

Montana

Bitter Root Fruit Growers' Association, Hamilton; Missoula Fruit and Produce Association, Missoula; Woodside Fruit Growers' Association, Woodside.

Utah

Farmers and Fruit Growers' Forwarding Association, Centerville; Ogdgen Fruit Growers' Association, Ogdgen; Brigham City Fruit Growers' Association, Brigham City; Utah County Fruit & Produce Association, Provo; Willard Fruit Growers' Association, Willard; Excelsior Fruit & Produce Association, Clearfield (Post-office Layton R. F. D.); Centerville Fruit Growers' Association, Centerville; Bear River Valley Fruit Growers' Association, Bear River Valley; Springville Fruit Growers' Association, Springville; Cache Valley Fruit Growers' Association, Wellsville; Green River Fruit Growers' Association, Green River; Farmers and Fruit Growers' Forwarding Association, Centerville.

New Mexico

San Juan Fruit and Produce Association, Farmington.

California

The Supply Company of the California Fruit Growers' Association, Los Angeles; California Fruit Exchange, Sacramento; Loomis Fruit Growers' Association, Loomis; Newcastle Fruit Growers' Association, Newcastle; Penryn Fruit Growers' Association, Penryn; Vacaville Fruit Growers' Association, Vacaville; Turlock Fruit Growers' Association, Turlock; Winters Fruit Growers' Association, Winters; Lincoln Fruit Growers' Association, Lincoln; Lodi Fruit Growers' Union, Lodi; Fresno Fruit Growers' Co., Fresno; Stanislaus Farmers' Union, Modesto; California Farmers' Union, Fresno; Sebastopol Berry Growers' Union, Sebastopol; Apple Growers' Union, Sebastopol.

British Columbia

British Columbia Fruit Growers' Association, Victoria; Victoria Fruit Growers' Exchange, Victoria; Hammond Fruit Association, Ltd.; Hammond; Hatzic Fruit Growers' Association, Hatzic; Western Fruit Growers' Association, Mission; Mission Fruit Growers' Association, Mission; Salmon Arm Farmers' Exchange, Salmon Arm; Armstrong Fruit Growers' Association, Armstrong; Okanagan Fruit Union, Limited, Vernon; Kelowna Farmers' Exchange, Limited, Kelowna; Summerland Fruit Growers' Association, Summerland; Kootenay Fruit Growers' Union, Limited, Nelson; Grand Forks Fruit Growers' Association, Grand Forks; Boswell-Kootenay Lake Union, Boswell; Queens Bay Fruit Growers' Association, Queens Bay; Kaslo Horticultural Association, Kaslo; Creston Fruit and Produce Exchange, Creston.

Books we have read, own and recommend, which can be ordered of your local stationer, or direct. The initials after the name represent the publishers, whose addresses are found at the end of the list. These books can be ordered of the J. K. Gill Company, Portland, Oregon.

Fruits and Fruit Trees of America—	
Downing	W \$4.50
California Fruits—Wickson	P 2.50
Success with Small Fruits—Roe	DM .75
American Fruit Culturist—Thomas	WW 2.50
Strawberry Culturist—Fuller	J .50
The Principles of Fruit Growing—	
Bailey	M 1.25
Bush Fruits—Card	M 1.50
Horticulturists' Rule Book—Bailey	M .75
The Nursery Book—Bailey	M 1.00
Pruning Book—Bailey	M 1.50
Cyclopedia of Horticulture—Bailey	D 30.00
Nut Culturist—Fuller	J .75
Insects Injurious to Fruits—Saunders	L 2.00
Fungi and Fungicides—Weed	J 1.00
Insects and Insecticides—Weed	J 1.50
Spraying Crops—Weed	J .50
Spraying of Plants—Lodeman	M 1.00
Talks on Manure—Harris	J 1.50
Farming with Green Manures—Hartlan	F 1.00
Fertilizers—Voorhees	M 1.00
Irrigation Farming—Wilcox	J 2.00
Irrigation for Farm, Garden and Orchard—Stewart	J 1.50
Irrigation and Drainage—King	M 1.50
Gardening for Profit—Henderson	J 1.50
New Onion Culture—Greiner	J .50
New Rhubarb Culture—Morse	J .50
Asparagus—Hexamer	J .50
Vegetable Gardening—Green	WP 1.25
A B C of Potate Culture—Terry	R .45
Tomato Culture—Root	B .35
Melons—Burpee	B .20
The Vegetable Garden—Vermorin	D 4.50
The Forcing Book—Bailey	M 1.00
Garden Making—Bailey	M 1.00
Practical Garden Book—Nunn & Baeuy	M 1.00
Hedges and Windbreaks—Powell	J .50
The Soil—King	M .75
Fertility of the Land—Roberts	M 1.25
The Farmstead—Roberts	M ..
Rural Wealth and Welfare—Fairchild	M ..
Farm Poultry—Watson	M 1.25
How the Farm Pays—Crosier & H.	H 2.00
The First Book of Farming—Goodrich	1.00
Cyclopedia of Agriculture	J 4.50
The Principles of Agriculture—Bailey	M 1.25
Roses and How to Grow Them—	
Sibson & Holman	G .50

ABBREVIATIONS

Pacific Press Pub. Co., San Francisco, Cal.	P
Orange Judd Co., New York	J
Webb Publishing Co., St. Paul, Minn	WP
A. I. Root Co., Medina, Ohio	R
W. Atlee Burpee, Philadelphia	B
J. H. Gregory, Marblehead, Mass	G
Doubleday, Page & Co., New York	D
A. T. Ferris, Shea	F
John Wiley & Sons, New York	W
W. W. Wood & Co.	WW
J. K. Gill & Co., Portland	G
J. B. Lippincott & Co., Philadelphia	L
MacMillan Co., New York	M
P. Henderson & Co., New York	H

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Kimball Cultivator at Work in Orchard at Morrisania

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The Kimball Cultivator works well out from the horses, and soil can be stirred close to trunks of trees, with horses walking out in the open. The Kimball takes a wide sweep at a time, and eight to ten acres of orchard can be cultivated per day. Thousands of Kimball Cultivators are now in use, and every person who has one recommends it. Mr. Irvine, editor of *The Fruit-Grower*, used two Kimball Cultivators at Morrisania last season; ask him what he thinks of them. Ask him also if the Kimball is not an ideal cultivator for any part of the country; he will tell you it is an ideal soil-stirring implement.

Clean Cultivation of Orchards Pays

It not only conserves moisture, but destroys the hiding places of insects, such as curelio, which are often serious orchard pests. Apples grown in cultivated orchards ripen later and consequently keep longer; they are of larger size and are usually smoother. The cost of cultivation is not excessive if Kimball Cultivators are used. Send for free booklet describing this great orchard implement—it's free for the asking.

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WHEN WRITING ADVERTISERS MENTION BETTER FRUIT

A New Apple Picker

By Charles D. Brooks, Grants Pass, Oregon

PLEASE permit me to use space in your good pages to call the attention of your readers to the invention of a fruit picker by Mr. George W. Hull. This new device is to be used in picking fruit from taller trees than is possible with the old system of ladders. With it any person can pick the fruit from the tops of any fruit tree in the state without breaking or bruising any of the limbs or body of the tree. The one who picks the fruit is up where the fruit is and can see and use both hands freely, thereby rendering much better service than was ever possible before with anything used in the fruit picking business. The apparatus is very simple and durable. When once installed it will last the grower for years without extra expense. The device can be put on any farm wagon or anything convenient to draw around in the orchard, and on this wagon or truck is a tall shaft fitted with a light traveling crane with adjusting levers and pulleys and a device for keeping shaft in an upright position, thereby giving absolute control and freedom to the operator. When in this position the operator can swing around in any and all parts of the tree and with a cord lower the picked fruit to the ground. He can adjust himself to any part of the tree, and once at the tree top does not need to come down till all the fruit shall have been picked, as the operator can then circle the whole top of any ordinary fruit tree, and can work much faster, for there need be no fear of slipping or falling. It is absolutely safe and speedy, and can be built and installed at a very reasonable price. Those who have had the pleasure of seeing the device and talking with the inventor speak very much in favor of the New Wonder Fruit Picker and predict all kinds of success for it.

Chelan, Washington, Output

The first accurate report of the 1911 fruit crop in Chelan County was made public today by Deputy State Fruit Inspector P. S. Darlington in his annual report to State Horticultural Inspector Huntley. The cars shipped are as follows:

	Cars
Freight billed from Wenatchee.....	1,714
Express from Wenatchee.....	240
Freight billed from Cashmere.....	459
Express from Cashmere	37
Express from Monitor	15
Freight from Peshastin	38
Express from Peshastin	1
Express from Malaga.....	14
Total	2,518
Fruit in storage, Wenatchee.....	150
Fruit in storage, Cashmere.....	76

Total output 2,738
The fruit is classified as follows:

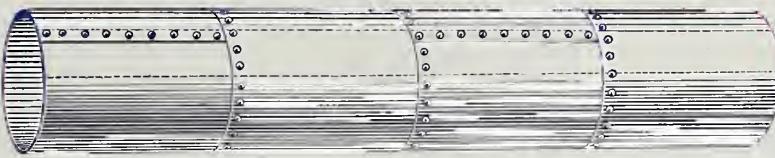
	Cars
Apples	2,000
Peaches	413
Pears	135
Plums	35
Apricots	75
Cherries	30
Melons and Vegetables.....	50

The value of the total crop is estimated at \$2,000,000.—Seattle Post-Intelligencer.

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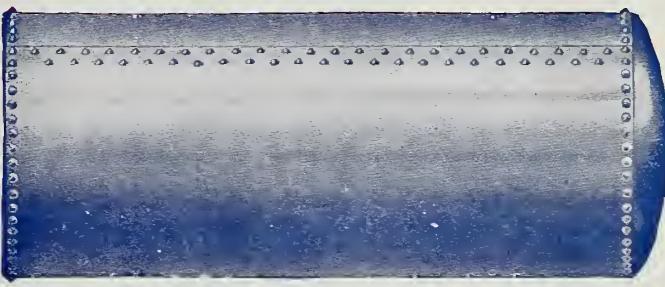


Steel Pipes
Save Labor

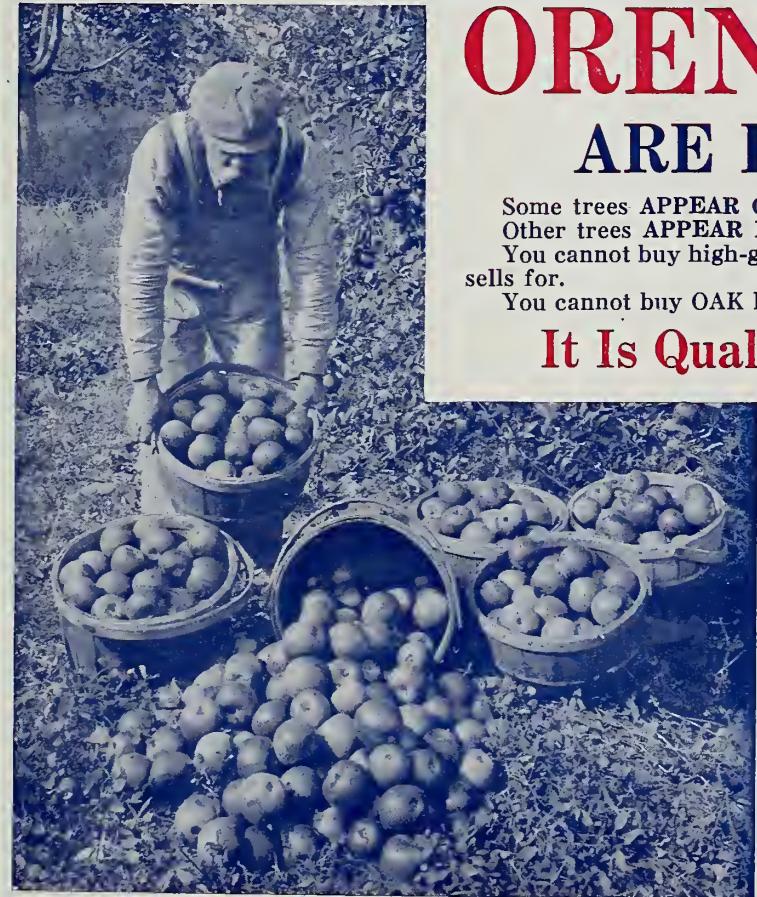
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